a W. R. C. Smith publication

FIFTY CENTS

Textile Industries

Formerly "COTTON"

AUGUST, 1958

MAN-MADE FIBERS

Exclusive 46-page feature, beginning on page 69, includes your handy new wall chart of properties and uses of man-made fibers

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page 115

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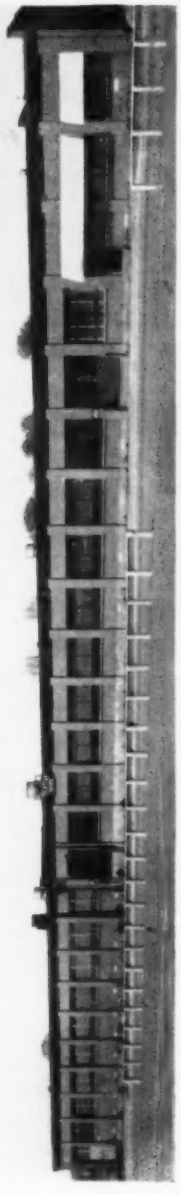

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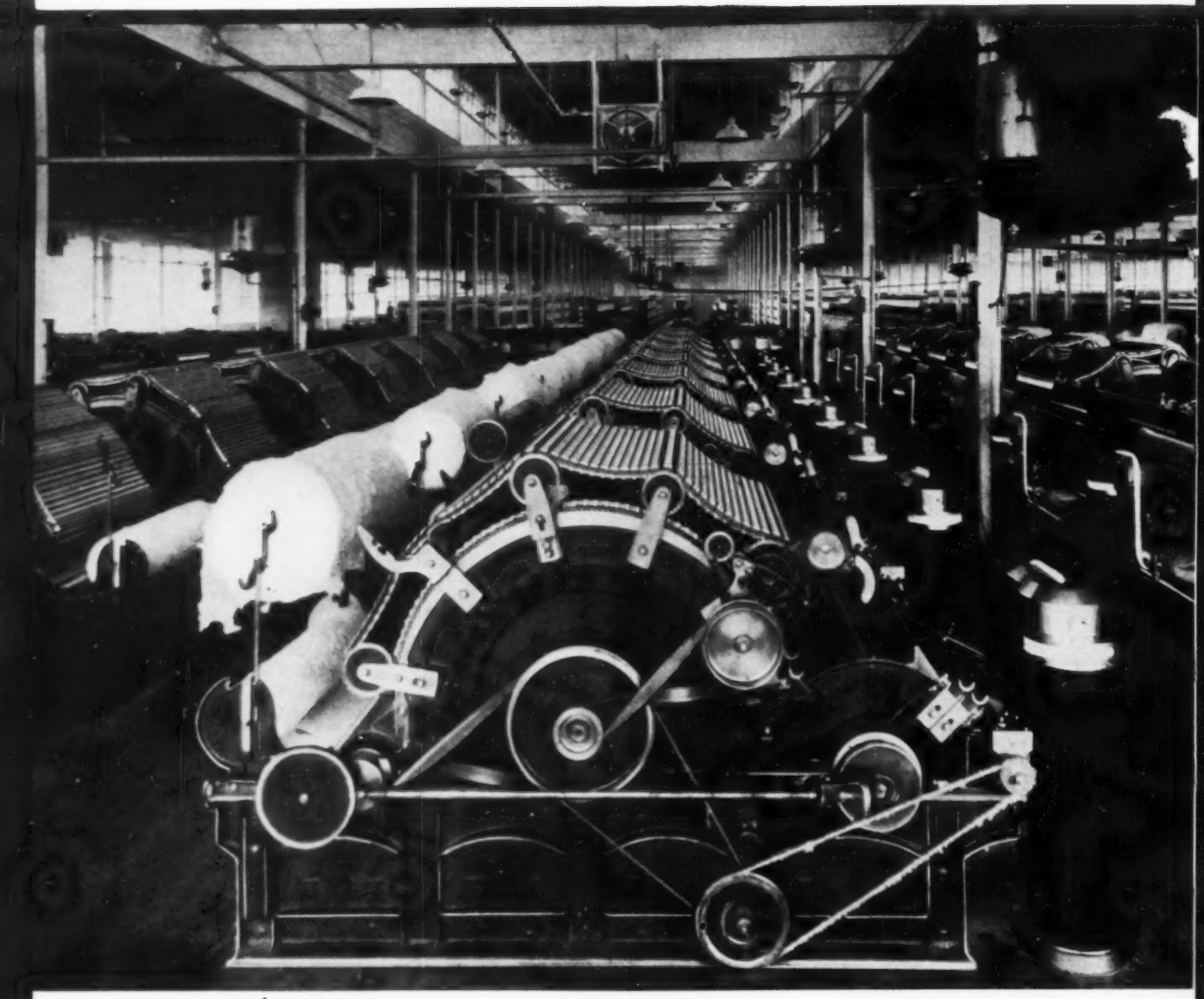

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Textile Industries

Formerly "COTTON"

Vol. 122, No. 8
AUGUST, 1958

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TIME SAVER for busy readers

Here is a summary of some of the major articles in this issue

Use it to organize your reading time most effectively

A Special Section on Man-Made Fibers 69-114

■ In a 46-page section written for this issue, TEXTILE INDUSTRIES presents its second annual review of the man-made fibers. And again our special editorial consultant is J. B. Goldberg, "Mr. Synthetics," who is a consultant to the textile and allied industries, and who for a number of years was research director for J. P. Stevens & Co., Inc.

With the increasing emphasis on blends which is becoming characteristic of the industry, it is fitting that the special man-made fibers section should start with an article which gives details on dyeing blended fabrics. The article, which gives particular emphasis to Dacron/cotton blends, is authored by John A. Komninos of the Waldrich Co., Delawanna, N. J., well-known dyers of synthetics and blends.

The current story of the wet processing of the man-made fibers is rounded out by an article on printing, by Herman P. Baumann of the Koppers Co., and a discussion of finishing, by Hector C. Borghetty.

Zefran, the first acrylic alloy fiber, has just gone into commercial production, and the first details of how to process it on the cotton, woolen, and worsted systems are given in a six-page article beginning on page 86.

If you haven't been inside a rayon staple manufacturing plant for some time, or if you haven't been in one at all, turn to page 92 for the story of how things have changed in the past few years.

Bound into the section, beginning on page 101, is an up-to-the-minute chart giving the properties and uses of the man-made fibers currently being produced in the United States. On the reverse of the chart is a glossary of trademarks for the man-made fibers (including textured yarns), and a list of the sales offices of their producers.

Other features of the section:

Rayon vs nylon tire cord (page 94); problems you'll meet in styling the man-made fibers (page 98); the current position of the polyolefin fibers (polyethylene and polypropylene), among the fastest growing of the synthetics (page 107); and the story of what's new in textured yarns.

No Slubbers Allowed! (Mill Spins Sliver) 115

■ Rockford Mfg. Co., Rockford, Tenn., recently put in can spinning for all but its knitting yarns. One of TI's editors reports on why the mill decided to spin from sliver, what other changes were necessary in going to can spinning, and how the change has affected the mill.

Supply Control System at Erwin Mills 119

■ The controller of Erwin Mills, John McArthur, tells in great detail how his firm set up a supply room system that is both simple and effective. One of the innovations used is that of printing a card, or slip, for each item on inventory, numbering the cards serially, and taking one of them out of a tub file as a part is issued. The top number of the remaining slips tells the clerk how many parts remain.

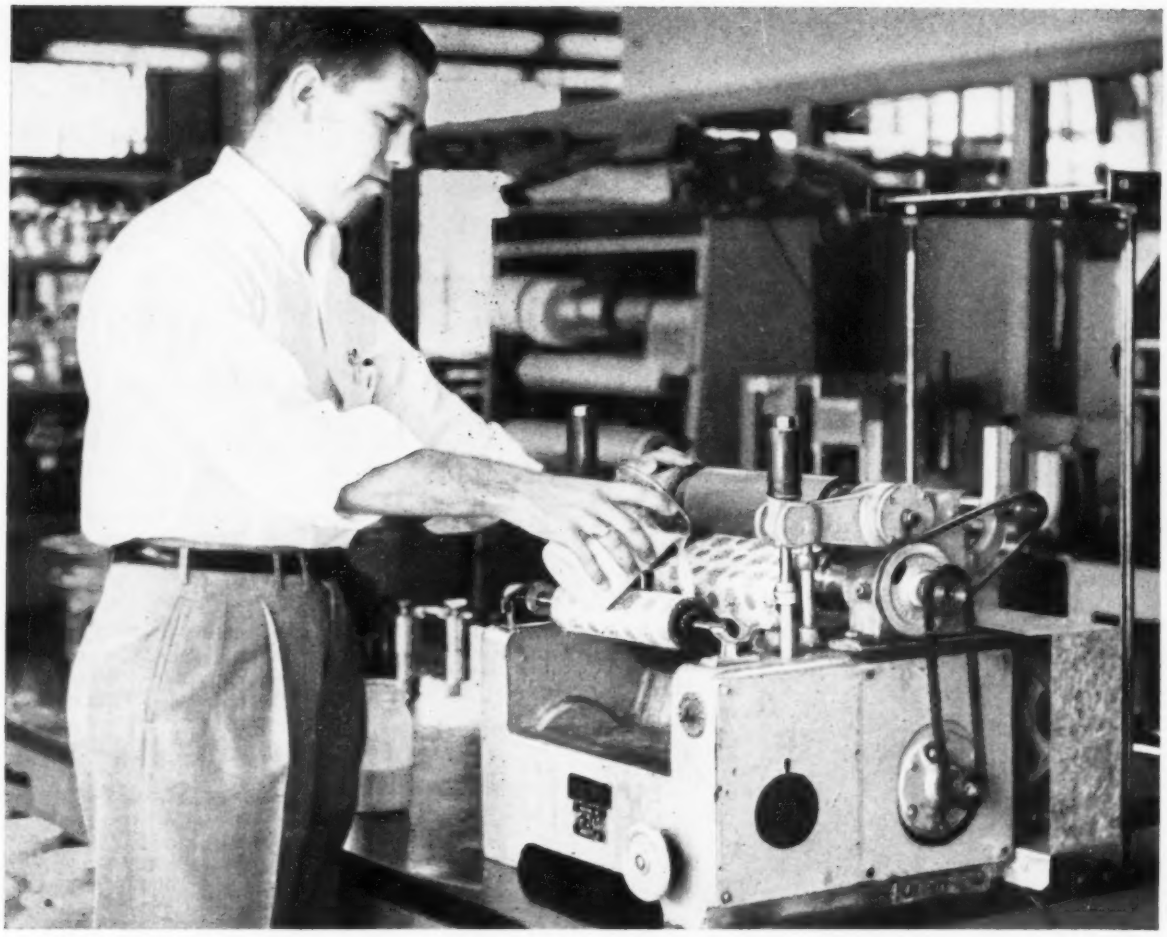
Pointers for Twin-Thread Knitting 157

■ Techniques involved in changing to twin-thread knitting include a threading system that will minimize cut holes, press-offs, and skips —the author gives his threading system in detail. Cleanliness, important in any style and on any machine, is especially essential on twin-thread knitting. Things to look for: sleazy knitting, proper draw-off, pull threads, pick hazards, and again, skips.

Instruments Help China Grove Overhaulers 129

■ The dial micrometer and the Spectrograph are used at China Grove Cotton Mills to keep machinery breakdowns at a minimum. The author, Ashley Roberts, points out that stock from a frame about to be overhauled is checked on the Spectrograph before the unit is taken out of production. The tests show just what the frame's rolls and gears need to bring the unit back into first-class condition. Each overhaul crew keeps the dial micrometer handy to check roll runout, eccentricity in calender rolls, card cylinders, doffers, journals, etc.

TEXTILE INDUSTRIES is indexed in the "Applied Science & Technology Index"



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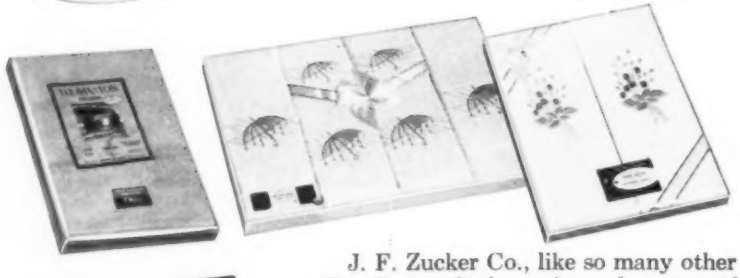

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Shorts and Remnants

► Hey there! Wake up! It's August already—time to go fishing—only 129

more shopping days until Christmas —less than 2 months until the big Southern Textile Exposition at Greenville, S. C. That being that, what are we doing about dog days, August, etc.? Let's see now:

Most Interesting

"I have noted a publication of yours that appears to be most interesting to me . . . 'Man-Made Fibers' [Sept. '57]"

JOHN W. DUTCHER
Pres.
The Fox River Valley Knitting Co.
Appleton, Wis.

► Since we are still getting comments and reprint requests on Sept. '57 Synthetics Section, it's high time we did something about a man-made fibers feature section for 1958. So, the time has come and here it is (again with the good assistance of J. B. Goldberg). See pages 69 to 114. We hope you like it.

More and more TI readers ask questions on synthetics, so more of them must be processing these fibers. Sounds logical as synthetic fiber production continues to increase not only in total pounds but in per cent of all fibers. As quoted elsewhere in these pages from the *Textile Organon* of Textile Economics Bureau, man-made fiber output of 6,339 million lb for 1957 accounted for 23 per cent of all textile fibers. This compares to 18 per cent of the total in 1953.

Further increase in production capacity of rayon and acetate fiber plants by Dec. 1959 is estimated at 4 per cent; in non-cellulosic fibers and yarns, 39 per cent. What we want to know is this: Are they starting to run out of names for new fibers?

Strangely enough, wool fibers made a slight comeback from 1953 to 1957 with a jump from 10 per cent to 11 per cent of world totals. Also, figures show a remarkable increase in woolen and worsted production

(Continued on page 10)

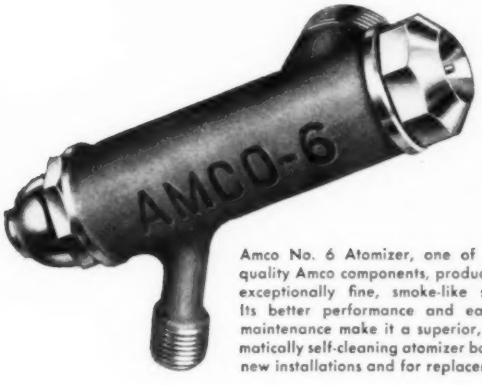
First introduced in 1928...

1928 was a banner year! That was the year Cannon Mills Company brought out its now-famous "towel ensemble" . . . announced *colored* hand and bath towels for the first time, as well. It was back in 1928, too, that Cannon also insured *finer* product quality with another innovation . . . AMCO Humidification.

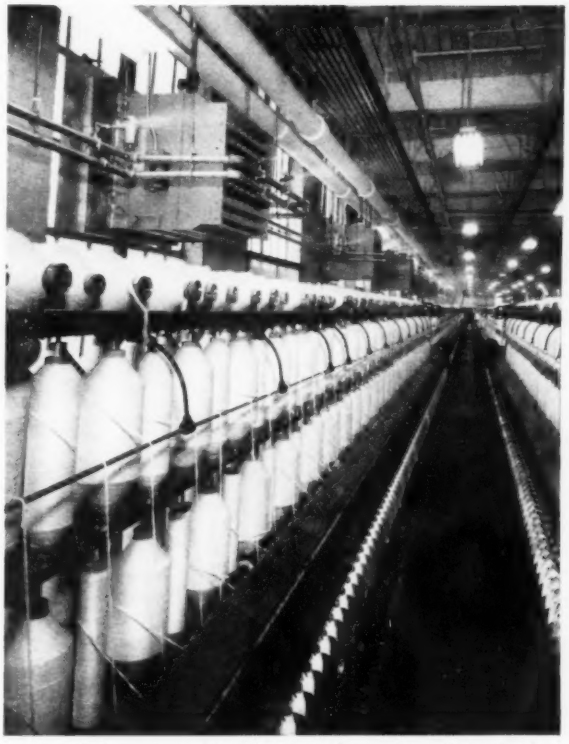
In the 30 years since then, as Cannon has diversified its product line and added new manufacturing facilities, American Moistening Company has continued to work closely with Cannon in the installation of *carefully engineered* Amco Air Conditioning Systems.

Amco, of course, designs all types of systems — humidification; humidification in combination with cooling, as in a ductless evaporative cooling system; unit dry-duct systems; or central station air conditioning.

For expert advice, backed by many years of textile air conditioning experience, let an Amco engineer suggest a solution to *your* particular air conditioning problem. Naturally, there's no obligation.



Amco No. 6 Atomizer, one of many quality Amco components, produces an exceptionally fine, smoke-like spray. Its better performance and ease of maintenance make it a superior, automatically self-cleaning atomizer both for new installations and for replacements.



Amco ductless system of humidifying, cooling and ventilating installation in spinning room at Cannon Mills plant in Kannapolis, N. C.

AMCO
SINCE 1888
AIR CONDITIONING EQUIPMENT

AMERICAN MOISTENING COMPANY • CLEVELAND, NORTH CAROLINA
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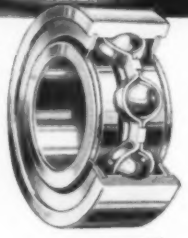

Fafnir Wide-Type Plya-Seal Ball Bearings used in the belt-driven Bahnson Collecto-Vac are made in standard bore and outside diameter sizes, but having double row widths. Of the non-filling slot type, they are capable of carrying radial, thrust, and combined loads.

AND FAFNIR BALL BEARINGS

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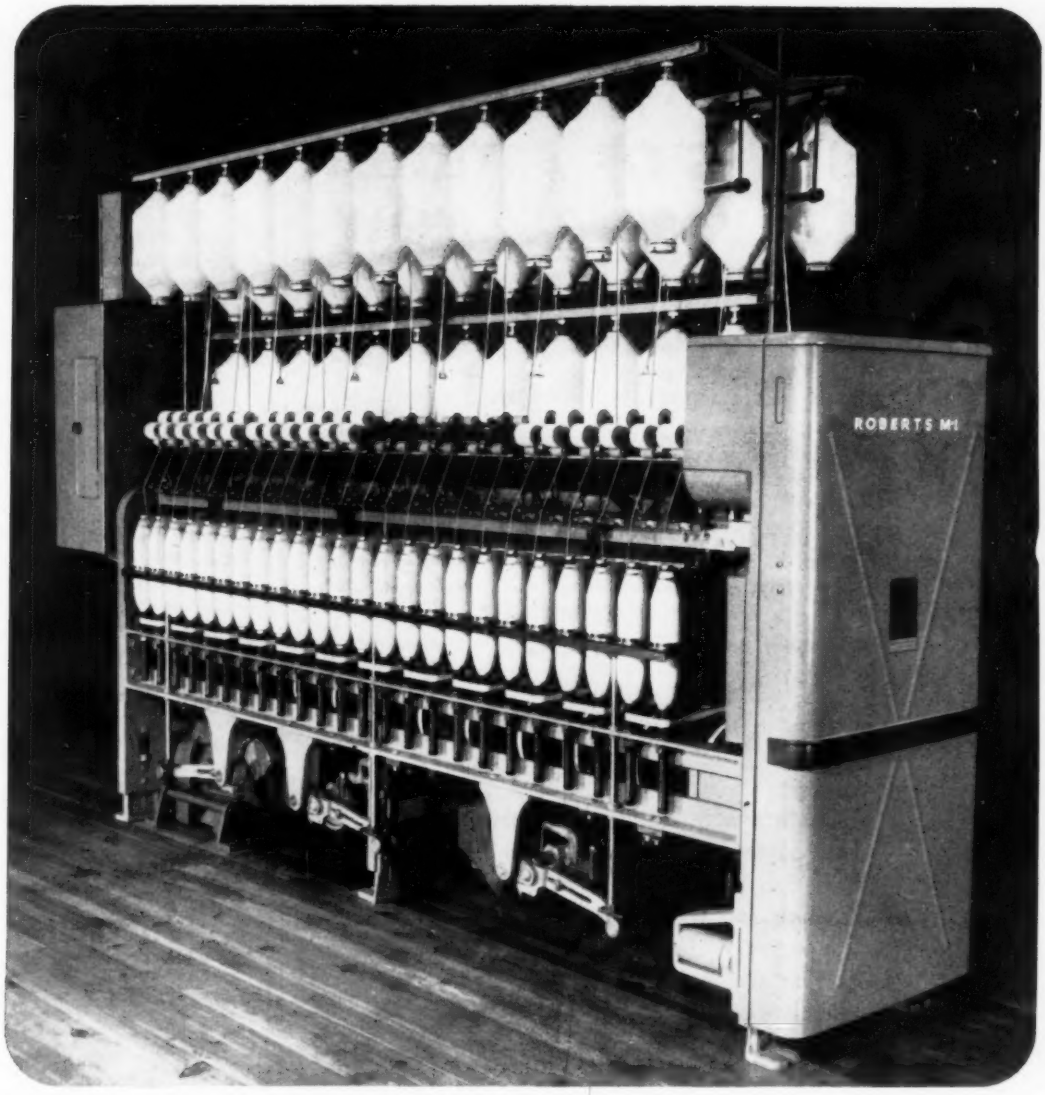

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The Material to be Sized—Man-Made Fibers
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Testing and Analysis of the Sized Materials
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Shorts and Remnants

(Continued from page 6)

facilities in the South. Since they always used to talk about the mills moving closer to the raw fiber, maybe the South had better figure on growing some more sheep or whatever they make wool out of.

► Before we get away from it, ole S&R promised last month to tell more about Robert E. Lee's surrender (Honest, that picture we carried showing Grant surrendering to Lee was a phony. We just found this out.) which did not end the Civil War. There was nothing Civil about it, and they're still fighting it here and there. But actually Lee's surrender still left three Confederate armies or forces fighting or dodging.

General Joseph E. Johnson had become so good at maneuvering Sherman by that time that Sherman said he was "equal in generalship" to the immortal Robert E. Lee. He still had almost 40,000 Confederate troops around Raleigh-Durham but was hemmed in by Sherman at Durham Station, N. C., Apr. 26, over 2 weeks after Appomatox. There still remained General Richard Taylor and General Kirby Smith with small forces in Alabama and West. General Taylor surrendered to U. S. General Canby at Citronelle, Ala., May 4; Texan Smith gave up to the same General Canby at New Orleans or in Texas May 14—almost 6 weeks after Abraham Lincoln's assassination in Washington.

General Johnson lived to serve in U. S. A. legislature—dying a natural death in 1890. History doesn't say too much about Generals Taylor and Smith, but the Yankee General Canby who cornered them to end the war got himself murdered by Modoc Indians a few years later.

Old "War is Hell" Sherman turned around and arranged peace terms with Johnson allowing retention of arms and regaining citizenship for Confederate soldiers—so favorable that northern radicals repudiated them and accused Sherman of "selling out."

Well, there you are. We gave you so much about the War Between the States that we don't even have room for that dope on the Declaration of Independence not being signed July 4th but in August. Maybe we can get to that in September.

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(Zĕf-răn), n. 1.

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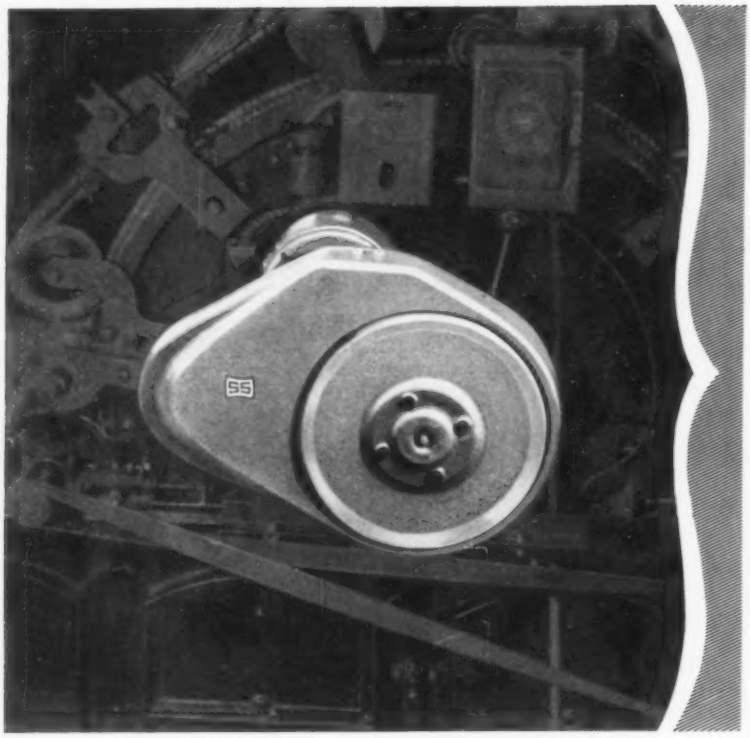

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Here is why we honestly believe the Southern States CD-2 Card Drive is the safest, simplest, most efficient individual drive on the market today:

Finger-tip control. No changes in operating procedure. Unit is controlled by simple clutch lever in both starting and hand stripping.

Full speed in seconds. A 1½ hp high torque card motor brings card into full operation, seconds after clutch is engaged.

Safety engineered. All belts and moving parts are covered. Starting and idling is accomplished by simple clutch lever.

Rugged construction. The entire unit is built for heavy-duty service: steel main stand; cast iron jackshaft bracket and main pulley; cast aluminum cover. Ball bearing throughout.

Easy installation. Fits any cotton card. Minimum number of holes to drill in frame. Drive pulley, collar and clutch are preassembled and slip on to shaft using existing keyway.

Get the facts from your Southern States representative or write for Bulletin 301-a.

SOUTHERN STATES
EQUIPMENT CORP.
HAMPTON, GEORGIA

Shorts and Remnants

August. For example, how about bathing girls? Not one, but eight—8,

count 'em—of them entered the June Swim Girl Contest of the Knitted Outerwear Mfrs. Assn. (photo courtesy of good friends "Knitted Outerwear times" and Editor **Chas. Reichman**).

Non-Wovens

A sign on the expressway in Atlanta, Ga., says "Weaving Is Dangerous," but we still didn't realize non-wovens would be interesting to so many of our readers. Thank you one and all for the comments on "Non-Wovens Up to Date" and "Non-Wovens Today and Tomorrow" [May '58]. We are sorry we didn't reprint these features for such requests as came from **P. S. Taylor,** Asst. Mgr., Kendall Co., Walpole, Mass.; **Robert W. Philip,** V.P., Callaway Mills Co., LaGrange, Ga. (former TI ed.); **R. C. Landon,** Sales Mgr., Noone Div. F. C. Huyck & Sons, Peterborough, N. H.; **Tecla R. Howden,** James W. Howden Co., 86 Fifth Ave., N. Y.

Fabric Defects in Wool Finishing

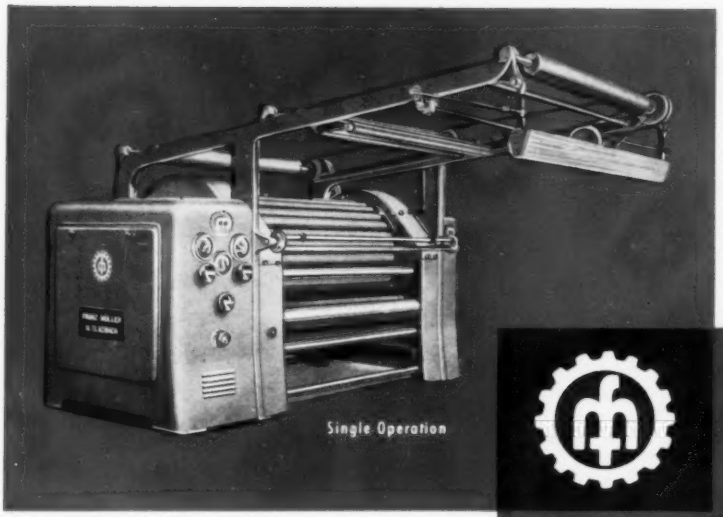
Better news for **F. Milne,** Pur. Agt., Paton Mfg. Co., Ltd., Sherbrooke, Que., Can.; **Ronald L. Gutman,** Sec. Treas., Dorman Mills, Parsons, W. Va.; and French Embassy in N. Y., among others noted previously as requesting reprints of 3-article series on fabric defects in wool finishing. Reprints are now available on this series.

Scrim for Tufteds

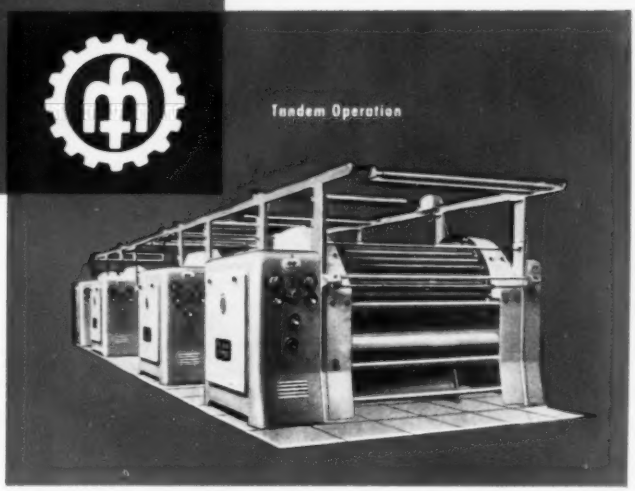
M. S. Jablin, Sls. Mgr. Stabilock, Inc., N. Y., writes that an interesting article on tufted carpets [June '58] shows photographs on pages 104 and 105 of knitted scrim pulled away from carpet back and that his firm is the sole manufacturer of this type scrim.

(Continued on page 22)

WHY 80? MAYBE 30 ARE SUFFICIENT



THE RESULT
OF 100 YEARS
EXPERIENCE



30 of these high speed nappers replaced 80 standard nappers in a North Carolina mill

for reasons of:

- **New Processing Methods**
- **Unequalled Finish**
- **Highest Production**
- **Labor Savings**

Our agents and service engineers are in the field. Contact them, they'll give you advice.

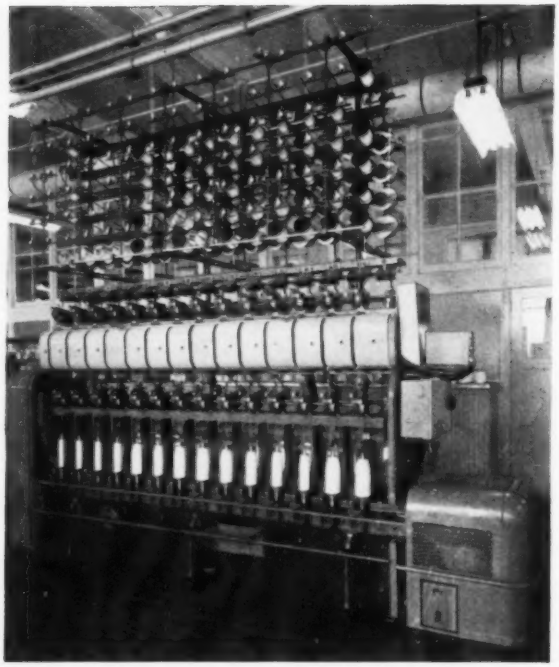
SOUTHERN U.S.:
PARROTT & BALLENTINE,
610 S. CAROLINA
NATIONAL BANK BUILDING
GREENVILLE, S.C.

NORTHERN U.S.:
TEXTILE MACHINERY
IMPORT CO.
277 NORTH AVENUE
NEW ROCHELLE, N.Y.

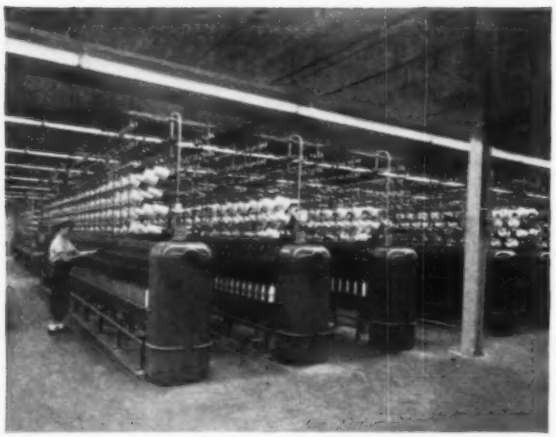
COMBITEX
COMBINE OF TEXTILE MACHINERY MANUFACTURERS

FRANZ MÜLLER • MASCHINENFABRIK • M.GLADBACH (WESTERN GERMANY)

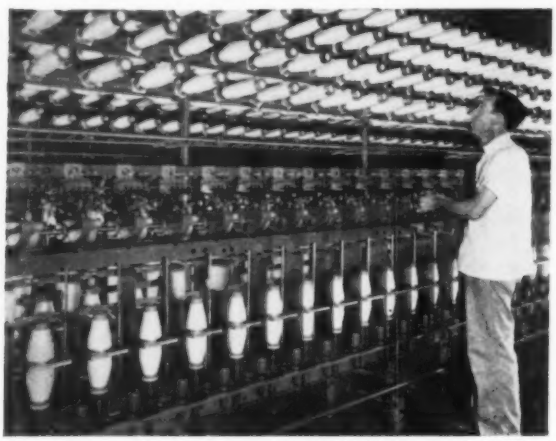
See Some of Many Results You Get from the Model 10 Ring Twister



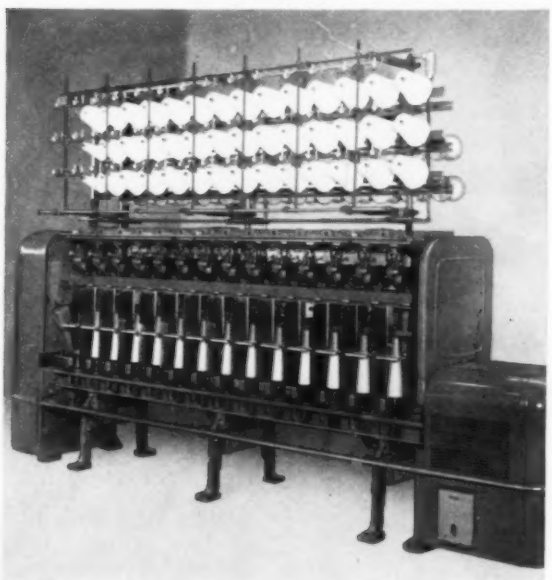
Only the Model 10 can use the No. 511 Saaba* attachment, to process uniform, top quality Saaba, the last word in textured yarn.



Worsted, spun synthetic and metallic yarns can be plied from cones, and taken up on large packages.

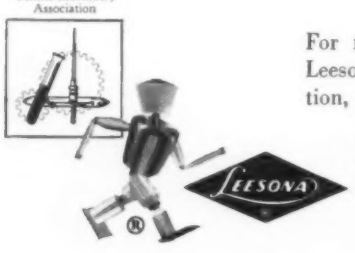


Glass yarn can be twisted from pirns to double-taper packages, and be used for filling and warping without rewinding.



Model 10 can take up yarn on cones, also produce straight wind, taper-top, and double tapered packages (filling or warp wind).

Member American Textile Machinery Association



23.7.7

For more information on how the versatile, low-maintenance, Leesona Model 10 Ring Twister can improve your twisting production, write for Bulletin 10-A.

UNIVERSAL WINDING COMPANY, P. O. Box 1605, Providence 1, R. I.

Sales Offices: Boston, Philadelphia, Charlotte, Atlanta, Los Angeles; Montreal, Hamilton, Canada; Manchester, England; Paris, France; Basle, Switzerland.

SAABA is a trademark of Universal Winding Company

News about

B.F.Goodrich Chemical *raw materials*

Boost sales with better backing

The firmest foundation for customer satisfaction results from a rug backing that meets carpet construction and market needs. For example, moderate or low-priced woven carpets or rugs call for backings that possess a high degree of covering power and opacity, in addition to tuft locking or binding efficiency. You get these advantages from a combination of Geon® polyvinyl materials and Hycar® nitrile rubber latex that also lets you vary hand, covering power, degree of whiteness, and washability or dry cleanability.

For premium tufted and woven constructions, formulations based on Hycar acrylic latex give outstanding binding efficiency and yield a colorless coating that is stable under both heat and light. They provide good washability and dry cleanability, too. These characteristics make these formulations ideal where appearance of construction is a major sales consideration.

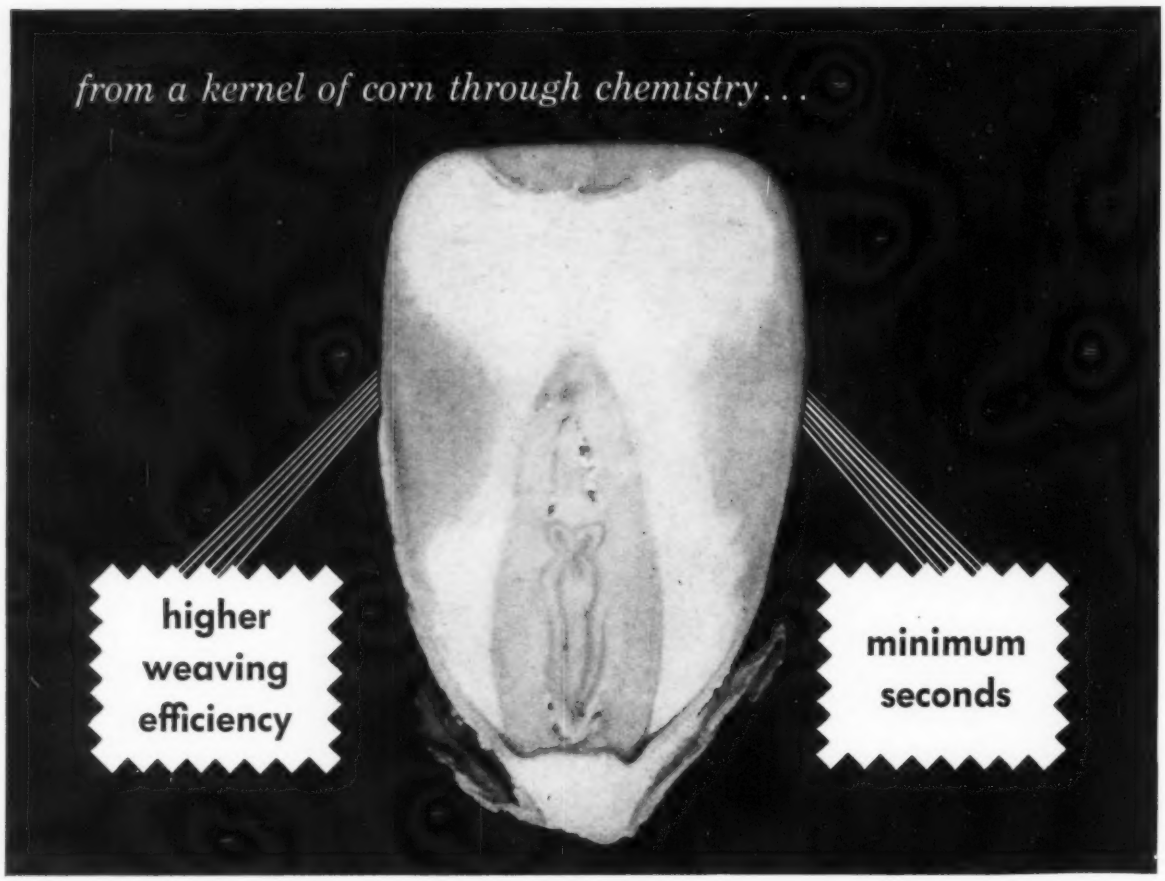
Here's another example of service you can get to produce better textiles for wider appeal, at lower costs. For information, write Dept. SA-4, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio.

PRODUCTS FOR TEXTILE IMPROVEMENT

B.F.Goodrich Chemical Company
a division of The B.F.Goodrich Company

B.F.Goodrich

GEON polyvinyl materials • HYCAR American rubber and latex
GOOD-RITE chemicals and plasticizers • HARMON colors



NALEX®: a warp size for spun rayon and worsted yarns

NALEX is starch changed through chemistry. It is noncongealing. Because of this, Nalex improves penetration; prevents hard size; and forms stronger, more continuous films on spun rayon or worsted yarns.

The result?

Seconds are reduced. Efficiency is increased—even at low humidities.

NALEX is compatible with resins and synthetic binders. Highly recommended for sizing the new blends of natural and miracle fibers.

STARCHES **National** RESYNS®

STARCH PRODUCTS INC.

National Starch Products Inc., 750 Third Ave., New York 17, N. Y. • Atlanta • Boston • Philadelphia
In Canada: National Adhesives (Canada) Ltd., Montreal

Huge 96" Acid Fume Fan—210,000 cfm "Buffalo" Axial Flow Fan with cast aluminum wheel, installed in a textile mill.

In Stack Hood Exhaust — Easy installation is a big advantage of the duct-size "Buffalo" Axials mounted in these stacks. Hoods give all-weather protection.

FOR TOP AXIAL FLOW FAN EFFICIENCY— IN BIG JOBS OR SMALL—

SPECIFY "BUFFALO" AXIALS

"Buffalo" Axial Flow Fans provide extremely quiet and efficient performance. This inherent efficiency is further improved by the "Buffalo" Vaneaxial outlet guide vanes. These carefully engineered vanes re-direct the swirling air at the fan outlet, converting it into increased forward thrust.

These sturdy, reliable fans are light in weight, permitting easy installation. Except for the largest models, no structural support or heavy foundation are required. "Buffalo" Axials can be installed as a section of the duct or stack in hood and other roof exhaust systems.

Duct-size "Buffalo" Axials save space by fitting in close to walls or ceilings. Space-saving installations include service as ventilation, exhaust and industrial air conditioning supply fans. They are widely used for applications ranging from paint spray booth exhaust to boiler room cooling.

"Buffalo" Axial Flow Fans are available for high or low temperatures, corrosive fumes, explosive atmospheres and other severe conditions.

Investigate the many advantages offered by "Buffalo" Axial Flow Fans. Contact your nearby "Buffalo" engineering representative, or write direct for Bulletin 3533-EF.

BUFFALO FORGE COMPANY

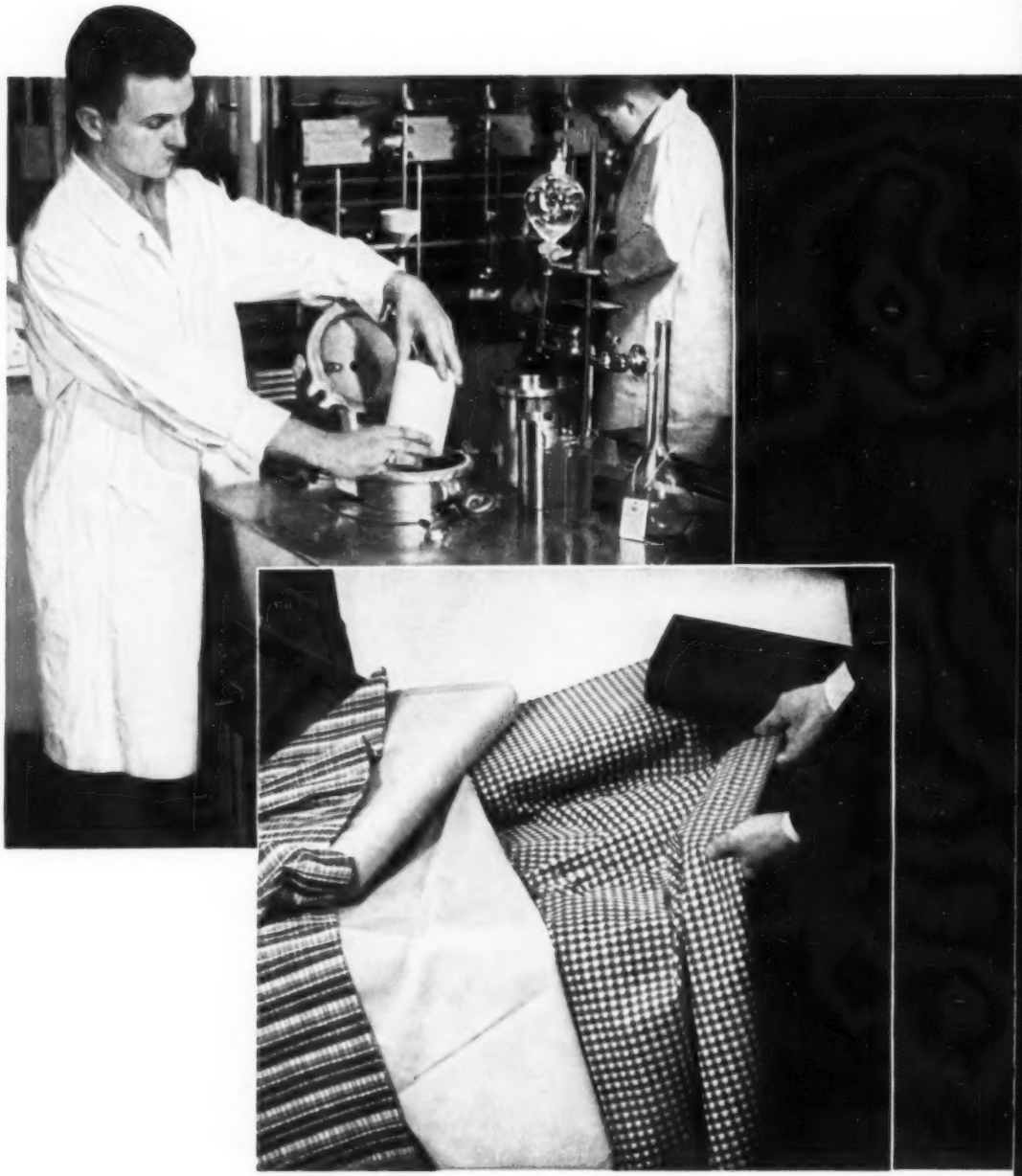
175 Mortimer St. • Buffalo, N. Y.

Buffalo Pumps Division • Buffalo, N.Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING
FORCED DRAFT COOLING HEATING PRESSURE BLOWING

Dyers know that National



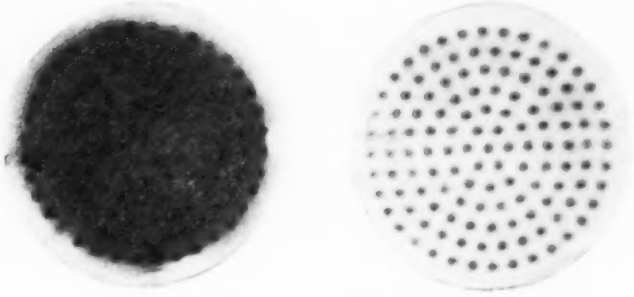
NATIONAL ANILINE DIVISION

ALLIED CHEMICAL CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

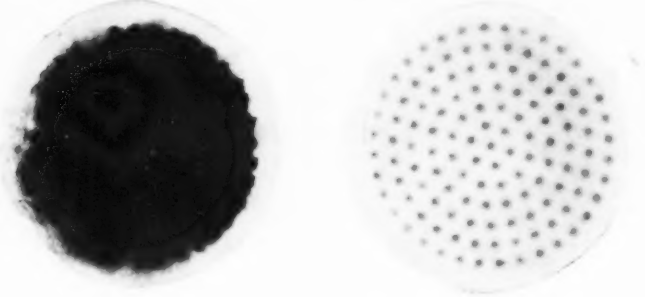
Akron Atlanta Boston Charlotte Chattanooga Chicago Greensboro Los Angeles
New Orleans Philadelphia Portland, Ore. Providence San Francisco Toronto

Carbanthrene® Vats are Cleaner !

these filter tests tell why!

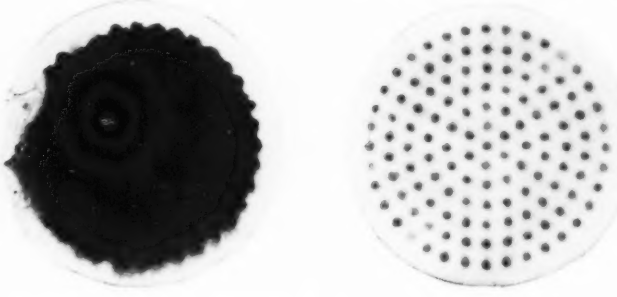


Dispersibility of Vat Dyes
as demonstrated by Buchner Funnel Filter Test



Ordinary unimproved vat dyes

Corresponding modern National Carbanthrene® Dyes



These Buchner funnel filter papers prove conclusively the outstanding superiority of modern National CARBANTHRENES over ordinary vat dyes.

Vastly improved dispersibility means cleaner, brighter dyeings every time. Level shades, free of speckiness, are obtained in padding. Thorough, even penetration of packages and beams reduces waste. Rejects and seconds due to dyestuff failures are minimized.

And in storage, as in processing, the "new" CARBANTHRENES are easier to handle due to the fact that they exhibit little tendency to agglomerate.

The ultra-refined physical characteristics of the superior CARBANTHRENE Vats result from unique manufacturing techniques that were developed at our Buffalo Research and Engineering Center. A complete range is available now to meet every requirement of pigment application.

For an eye-opening trial in your plant, request working samples today.

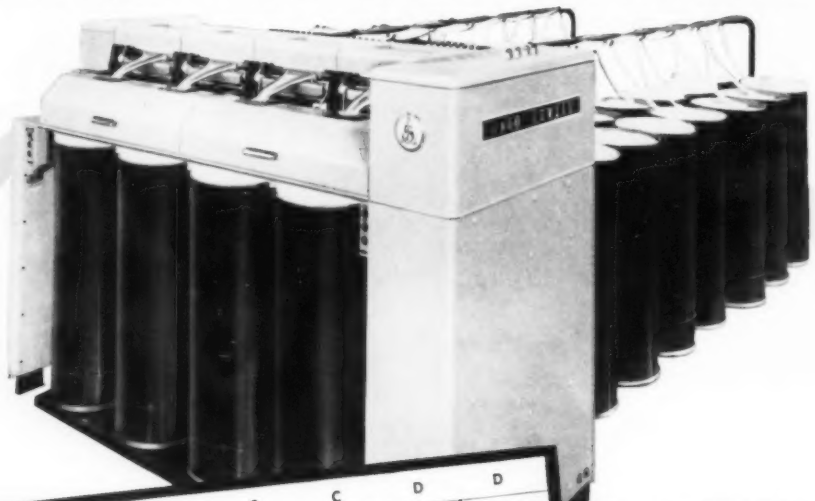
Allied Chemical

Obtain highest production of quality sliver by every standard --

-- PER DELIVERY
-- PER MAN HOUR
-- PER HORSEPOWER
-- PER SQUARE FOOT OF FLOOR SPACE

New VERSAMATIC

Drawing Frame by SACO-LOWELL



Mill	A	A	B	C	C	D	D
Stock	Carded	Carded	Combed	Combed	Combed	Combed	Combed
Process	1st Process	2nd Process	1st Process	1st Process	2nd Process	1st Process	2nd Process
Model Versa-matic	4 Over 5	4 Over 5	3 Over 4	3 Over 4	3 Over 4	3 Over 4	3 Over 4
Sliver Fed	52.5 gr.	54 gr.	55 gr.	120 gr.	60 gr.	62 gr.	55 gr.
Ends Up	8	8	8	4	6	6	6
Speed	300 ft./min.	300 ft./min.	260 ft./min.	216 ft./min.	216 ft./min.	250 ft./min.	250 ft./min.
Sliver Delivered	54 gr.	56 gr.	55 gr.	60 gr.	60 gr.	55 gr.	55 gr.
Tester	Saco-Lowell	Saco-Lowell	Saco-Lowell	Brush	Brush		
Variation	16%-19%	16%-19%	10%-13%	14%-16%	11%-13%		
Efficiency	92%-95%	92%-95%				82%	82%
Deliveries	16	16	60	32	32	12	12
Deliveries/Operator	32	32	30	32	32	24	24
Can Size—Back	18" x 42"	16" x 42"	15" x 36"	14" x 36"	14" x 36"	15" x 36"	15" x 36"
Can Size—Front	16" x 42"	16" x 42"	15" x 36"	14" x 36"	14" x 36"	15" x 36"	15" x 36"
Yards/Can	4000 yds.	4300 yds.	3300 yds.	2850 yds.	2850 yds.	3500 yds.	3500 yds.
Pounds/Can	31 lbs.	34 lbs.	25.9 lbs.	24.4 lbs.	24.4 lbs.	27.5 lbs.	27.5 lbs.
Draft	7.77	7.71	8.03	8.03	6.00	6.75	6.00
Pounds/Man Hour	1380 lbs.	1430 lbs.	1105 lbs.	1070 lbs.	1070 lbs.	772 lbs.	772 lbs.

THESE PRODUCTION FIGURES TELL THE STORY AND PROVE BEYOND DOUBT THAT VERSA-MATIC DRAWING FRAMES BELONG IN YOUR MILL

Contact your nearest Saco-Lowell office for complete information and a demonstration.

SACO-LOWELL SHOPS

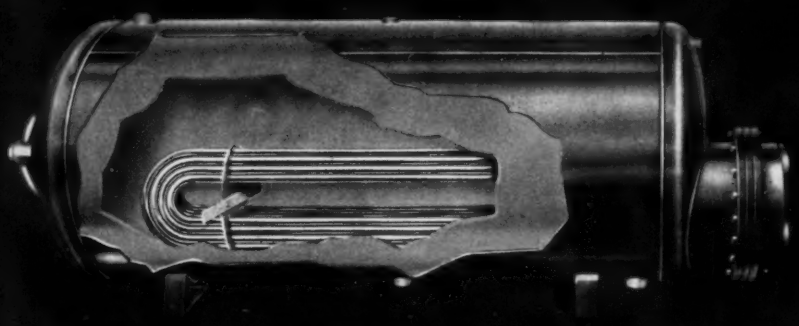
60 BATTERYMARCH STREET, BOSTON 10, MASS.

Shops at BIDDEFORD & SACO, MAINE; SANFORD, N.C.; EASLEY, S.C. Sales Offices: CHARLOTTE - GREENSBORO - GREENVILLE - ATLANTA

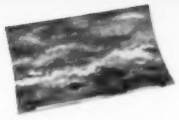
YOU GET

so much more at so little cost

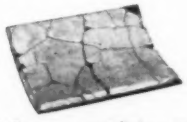
WHEN YOU CHOOSE



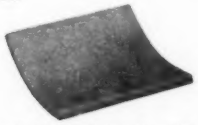
Patterson-Kelley cement-lined storage water heaters



Plain steel plate will corrode even under normal water conditions.



Ordinary cement linings tend to flake, crack and shrink, resulting in high maintenance costs.



Pre-Krete lined plate is still in perfect condition after exhaustive testing.

A P-K Pre-Krete* Lined Water Heater gives you double the life of a plain steel heater at only slightly higher first cost.

This long life of rust-free hot water service is made possible because Pre-Krete is a special pre-blended low soluble hydraulic cement formula. This durable lining is unaffected by extreme temperature changes, resists thermal shock and will not shrink, flake or crack.

Not only is your initial cost little more than for plain steel, but maintenance costs are appreciably lower. If lining repairs are ever needed, one man can make them quickly with a minimum of down time.

Moreover, Pre-Krete is inert to most substances and cannot contaminate the water or cause rust damage to fabrics.

Best of all, with a P-K Pre-Krete Lined Heater you get thermal designing that has maintained an unexcelled reputation for over 75 years, plus advanced fabrication techniques that meet all ASME specifications.

For complete details, write for Catalog 19 on P-K Storage Water Heaters. For information on field lining your existing plain steel vessels with Pre-Krete, ask for Bulletin 1012. The Patterson-Kelley Co., Inc., 2808 Warren St., East Stroudsburg. Pa. IN

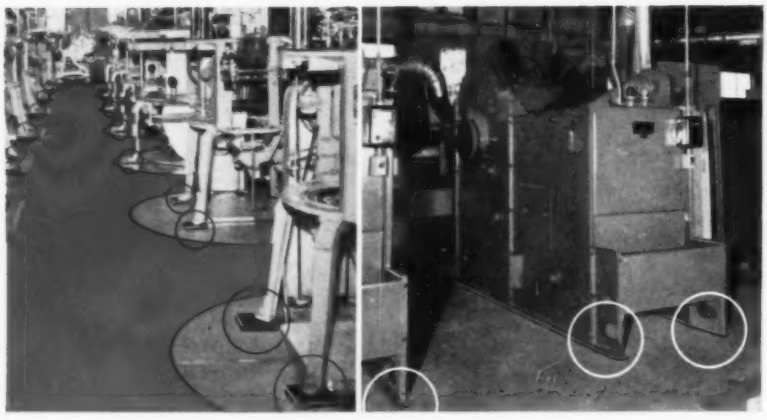
*Pre-Krete is a registered name

Patterson Kelley

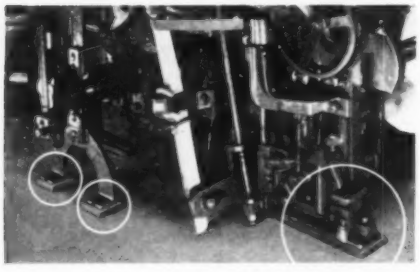
storage water heaters • instantaneous heaters • convertors • fuel oil heaters • freon chillers and condensers

Leading Textile Mills Report...

UNISORB Cuts Costs Reduces Noise and Vibration



Unisorb pads are used under all types of equipment to save installation time, eliminate lagging and bolting and reduce noise and vibration. Preparatory equipment, Circular Knitting Machines and Looms, as shown here, typify Unisorb installations. Unisorb is the only flexible mount available in variety of grades to suit "vibration personality" of each machine.



Unisorb pads save up to 75% in installation time — just apply cement to pad and set in place. **No danger of "walking"** and machines can be moved any time. Every mill can be made quieter and more efficient.

Make Sure All Your Machines Are On Unisorb! Send for Sample and Free Book — or contact your nearest Unisorb Distributor . . .

Industrial Supply Co., Clinton, S. C.
Textile Supply Company, Dallas, Texas;

UNISORB 212 SOUTH ST. BOSTON 11, MASS.
Division of The FELTERS Company

Want more information? Send for set of Unisorb "Facts" Books!

Please send me a Unisorb Sample and Free Book.

Company.....
Name.....
Address.....
City.....Zone.....State.....

FE8-31

Shorts and Remnants

(Continued from page 12)

Further, he asks if we will give Stabilock proper credits and mention for said scrim. So, we hereby do so.

By the way, if you need reprints of that special Tufted Textiles — 1958 section, just say the word.

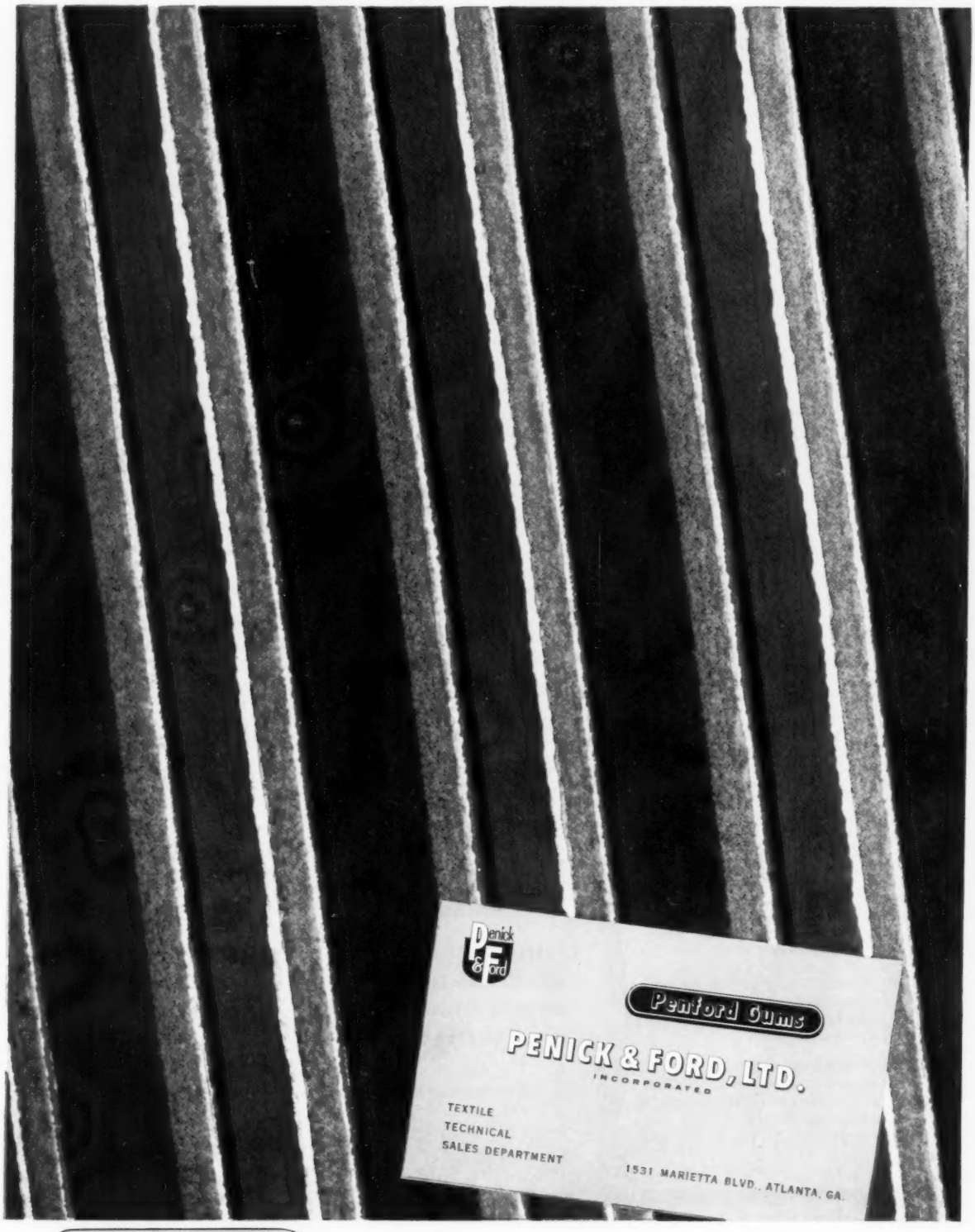
► Anybody who says **Walter F. Woodward,** V.P. Curtis & Marble Machine Co., doesn't swing a slick spade hasn't seen his stance in breaking ground for new C&M building to be

erected at Greenville, S. C. Walter, who spent 30 years in Greenville, is flanked on the left by **Junius H. Garrison, Jr.,** V.P., Alester G. Furman Co., and **Jack Federline,** C&M Sou. Mgr.; on our right by **Chas. E. Daniel,** builder; Sen. **P. Bradley Morrah, Jr.,** and **K. S. Gray,** Lockwood Greene Engineers, Inc. [Picture by Bill Coxe.]

Want to Buy

S&R hopes that E. F. Houghton's salesman (lower right hand corner in their Apr. adv.) gets an exit pass before he follows an inquiry from this ad from **B. J. Goehringer,** Supt. Ohio Penitentiary Cotton Mill at Columbus; also that Fairtex Corp. gets some German business from Apr. adv. inquiry from Th. & A. Brandt, Nurnberg; also that Benjamin Booth will get the idea of TI's Maine to Mexico readership from inquiries on Micro-Grind from their good double spread June adv. from such as **Lionel R. Audet,** W. S. Libbey Co., Lewiston, Me.; **P. J. Angelo,** Mgr. Wool Lab. J. P. Stevens & Sons, North Andover, Mass.; **P. E. Higgins,** Mgr. Acme Cotton Products Co., Inc., East Killingly, Conn.; **Clement Dostie,** Overseer Carding, Bates Mfg. Co. Edwards Div., Augusta, Me.; **Frank B. Ward,** Supt. Laurens (S. C.) Mills; **James L. Vinson,** Overseer Excelsior Mill #3, Rutherfordton, N. C.; **Hilados Guadalajara,** S. A. de C. V. Mex., and **Enrique Meyer,** Engr. Textile Monterrey, S. A. also Mex.

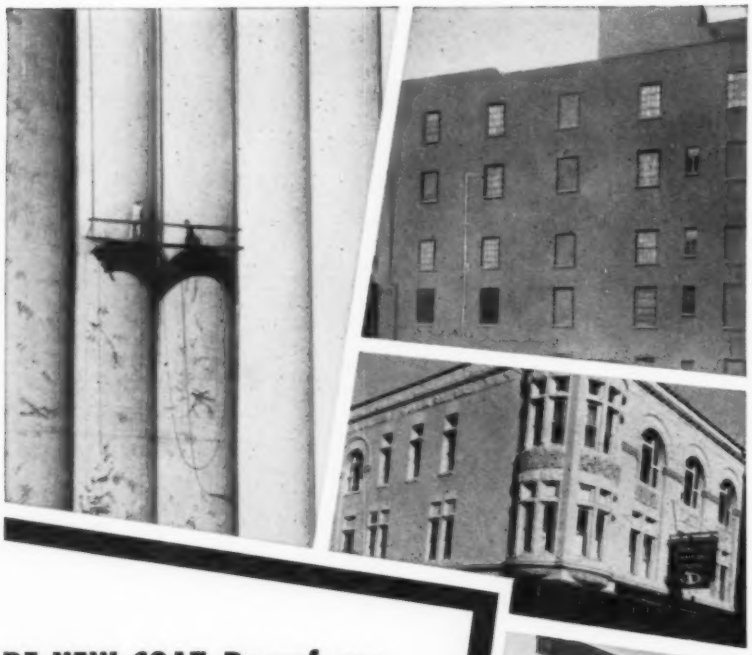
Then there was Parks-Cramer mixing us all up with a number 409 in small type in their June ad. Had us



Penford Gums THE **MODERN** WARP SIZING FOR **MODERN** WEAVING

Penford Gums provide exceptional warp yarn protection in weaving all modern fabrics — Viscose, Cotton, Worsted, Acetate, Nylon, Dacron, Acrilan, Orlon, Dynel, Zefran and blends.

There is a Penford Gum that will fit your warp sizing requirements. Penick & Ford Technical Sales Service Engineers will gladly assist you by recommending exact formulations and will provide continuous technical service. Write us today.



RE-NEW-COAT Resurfaces, Protects and Decorates Masonry Buildings In One Application!

Re-New-Coat, with an outstanding record of performance even under severe conditions, actually anchors itself into masonry surfaces and becomes part of the structure itself. It is resistant to alkali, acid fumes, smokes, gases and other corrosive factors. Remarkable adhesive qualities of Re-New-Coat, due to presence of Devran Epoxy Resin, insure a firm tight bond to masonry.

ECONOMY — Because of the several mil thickness of dense structurally strong coating, built with only one application, there is no need for a second time-consuming application.

LONG LIFE PROTECTION — Prolonged protection against surface erosion is just one of the beneficial characteristics inherent in Re-New-Coat.

WEATHER PROTECTION — Masonry structures subjected to constant erosion caused by driving rains and chemical fumes common to industrial areas are effectively protected for years to come.

TRUSCON "RE-NEW-COAT"® with Devran Epoxy Resin actually extends the life of your buildings!

•

FIELD DEMONSTRATION

Ask for field demonstration in one or more of the attractive colors available!

TRUSCON Laboratories
Industrial Maintenance
Division of Devoe & Raynolds Co., Inc.
Detroit 11, Michigan

TRUSCON Laboratories
Dept. T-21, 1700 Caniff
Detroit 11, Michigan

☐ Have field engineer call for appointment.
☐ Send more information on RE-NEW-COAT at once.

Name _____
Company _____
Address _____
City _____ Zone ____ State ____

Shorts and Remnants

looking all over place for request from **Harold Mitrani,** Supt. Milco Undergarment Co. Inc., Bloomsburg, Pa., who wanted further data on adv. page 409. Boy, that would be a big, thick book. It was actually on page 25.

It's a long way from Framingham, Mass., to Salt Lake City, Utah, for Atkinson, Haserick & Co. to follow up June inquiry on wool blending system from Salt Lake Deseret Industries. (That's right. We didn't make it up. They spell it "Deseret.")

Geigy Co. offered a documentary film for schools, etc., on "Insects Astray" in our June issue, so the "etc." had better include request from **R. Dreher,** Mgr. Erie Dyeing & Proc. Co., Cleveland, O. Geigy or other dye manufacturers may be able to furnish data on colors for vinyl and polyethylene as requested by **H. S. Gerry,** Lucerne Industries, Brooklyn.

From June issue, **Maurice Fishman,** Lee Dyeing Co., Johnstown, N. Y., wants more on Firestone latex. **Chas. Maldoff,** Formcraft Fabrics Co., Ltd., Montreal, Que., Can., writes on Standard Chemical "Stanset." Also, **G. Goodwin,** pres. Steelatex Corp. of Amer., Jefferson, Mass., wants the same on Scholler Bros. "FiberLok."

► Thanks to **Gordon Loeb,** Rockland Bleach & Dye Works Co., Baltimore, Md., for passing on remark of Baltimore Mayor, "I'm not worried about Nixon becoming Pres. I'm afraid Sherman Adams will die and Eisenhower will become Pres." Now there's a timely one. Also Reader Loeb passes on for our baseball fans the "mixed emotions" remark of Mayo Smith in taking over the management of the 7th place Phils—"It's sort of like watching your mother-in-law drive your new Cadillac off a cliff."

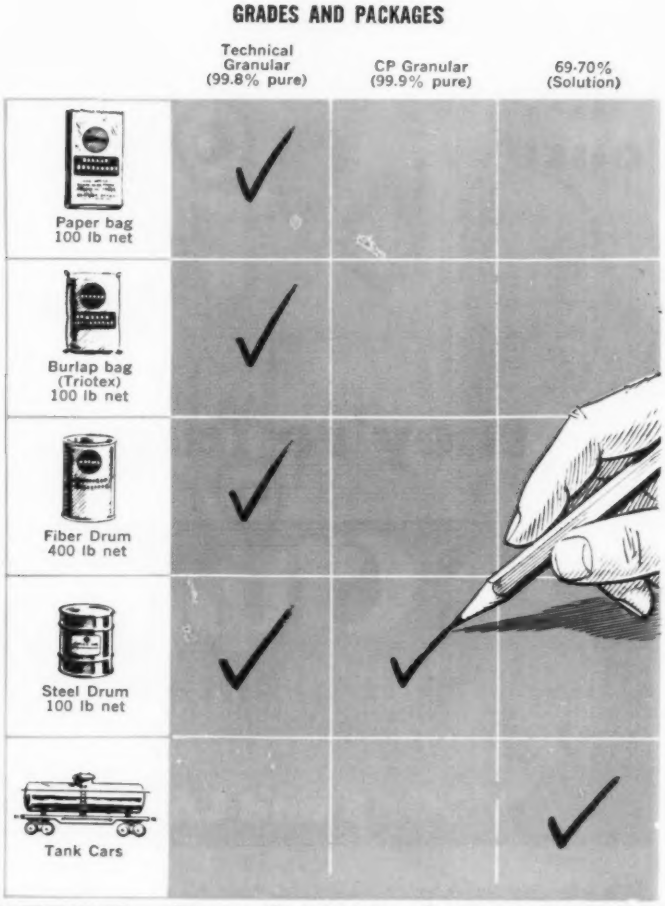
He Liked "Warp Sizing" Series

" . . . Even though I am now retired, I still look forward to receiving the 'T. I.' each month. The series of articles on slasher sizing ["Warp Sizing" by Paul V. Seydel in May, 1956, through Dec., 1957, issues] . . . I found most informative and interesting. . . . "

T. HARGREAVES
Blackpool, England

► That's music to our ears, Mr. Hargreaves. And we believe our readers will be glad to have the news that the "Warp Sizing" articles have been reprinted as a 512-page book which is

pick
the grade,
form and package
you need
of


GRADES AND PACKAGES
Technical Granular (99.8% pure)
CP Granular (99.9% pure)
69-70% (Solution)
Paper bag 100 lb net
Burlap bag (Triotex) 100 lb net
Fiber Drum 400 lb net
Steel Drum 100 lb net
Tank Cars

MUTUAL SODIUM BICHROMATE

In the Mutual line of chromium chemicals there is a grade, form and package of each product that's right for you.

For example, Mutual Sodium Bichromate is available in both Technical and C.P. grades, in granular and solution form, and a variety of packages to insure the most efficient and economical application to your processing requirements. Mutual technical service men can help you choose wisely – and aid in applying the product to your process.

In an emergency, your order for any Mutual product can be in transit in a matter of hours after it is placed. This is typical of Mutual service, backed by over 100 years as America's *first* producer of chromium chemicals.

Mutual chromium chemicals

Sodium Bichromate
Sodium Chromate
Chromic Acid
Potassium Bichromate
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SOLVAY PROCESS DIVISION
61 Broadway, New York 6, N.Y.

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MUTUAL chromium chemicals are available through dealers and **SOLVAY** branch offices located in major centers from coast to coast.

SOLVAY PROCESS DIVISION
Allied Chemical & Dye Corporation
Dept. 24, 61 Broadway, N.Y. 6, N.Y.

☐ Please send your Bulletin 52, "Chromium Chemicals," by return mail.

☐ Please have a representative call.

NAME_____ TITLE_____

COMPANY_____

STREET_____

CITY_____ ZONE_____ STATE_____

For further information use Handy Return Card, Page 181

with Clipper

HOOKS and LACERS

You can lace belts up to 12 inches wide all in one operation with Clipper Belt Hooks and Lacers. Until the Clipper hooks shown above were inserted into the jaws of the lacer, they were protected and held in place by a reinforced card that is easily stripped away once the hooks are in the lacer. The lacer jaws, exerting up to 45,000 lbs. of pressure, imbed the hooks firmly and uniformly across the width of the belt. And in the belt, each hook is separate from the others to give flexibility not possible with other methods of belt lacing. For unmatched speed, strength and flexibility, depend on the proved Clipper machine-lacing method.

FOR MORE INFORMATION

Detailed product information and case history examples of Clipper machine-lacing benefits are contained in Bulletin No. 157. Send for your free copy today.

Ask your Industrial Distributor for Clipper Products

Clipper BELT LACER COMPANY

980 Front Ave., N. W. Grand Rapids 2, Michigan

Shorts and Remnants

now available as a premium with a two-year subscription to TEXTILE INDUSTRIES (price, $5.00). Ole S&R just couldn't pass up this chance for a commercial.

TI readers contemplating early retirement will be interested in what this former superintendent of Caldwell Linen Mills of Canada and author of several TI articles on the manufacture of terry fabrics (his most recent was "How to Analyze Terry Fabrics" published last month) reported in the same letter extracted above:

" . . . This life of relaxation and retirement is suiting both myself and my wife. We have . . . so much going on all around us in this 'Atlantic City' of England that we have not yet felt any sense of boredom that our friends predicted for formerly active people living in retirement.

"I was always a very enthusiastic lawn bowler and every afternoon finds me out on 'The Green' in very beautiful 'Stanley Park' in Blackpool. So much outdoor life, instead of indoor textile mill conditions with the problems, is suiting me so well that even here in England I am sporting a 'Florida Tan.'"

Plumbing Spindles

"Can you tell me whether or not you have published in recent years an article describing the proper procedure for plumbing spinning, or twister, spindles. . . . "

R. A. BUTLER
Mgr.,
Spray Cotton Mills
Spray, N. C.

► Yes, Mr. Butler—May '52 p. 94-98, but all file copies are clipped, and the article was not reprinted. Photocopies are available from Library, U. S. Dept. Agriculture, Washington 25, D. C.

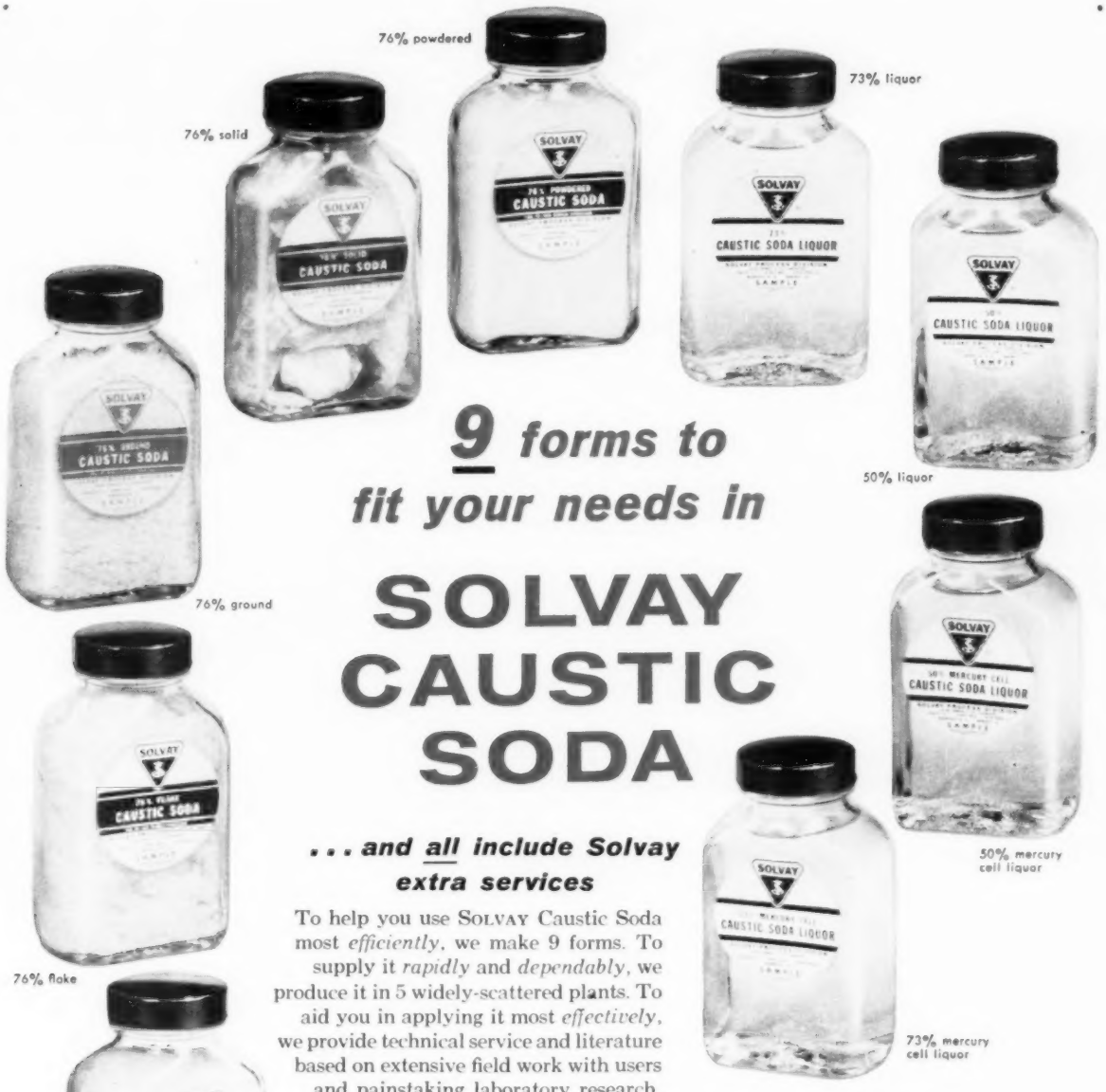
► We did better by **Travis Hall,** Bibb Mfg. Co., Macon, Ga., who wanted reprints on "Neps Measured By Standard Photos" [Apr. '58]. We had them.

Many Services

" . . . We are very grateful for the many services that your publication is rendering to the textile industry. . . . "

HARRIS M. MURRAY
Berkshire Hathaway Inc.
New Bedford, Mass.

(Continued on page 195)



9 forms to fit your needs in

SOLVAY CAUSTIC SODA

. . . and all include Solvay extra services

To help you use SOLVAY Caustic Soda most *efficiently*, we make 9 forms. To supply it *rapidly* and *dependably*, we produce it in 5 widely-scattered plants. To aid you in applying it most *effectively*, we provide technical service and literature based on extensive field work with users and painstaking laboratory research.

Sodium Nitrite • Calcium Chloride • Chlorine • Caustic Soda • Caustic Potash Chloroform • Potassium Carbonate • Sodium Bicarbonate • Vinyl Chloride • Methyl Chloride • Ammonium Chloride • Methylene Chloride • Monochlorobenzene Soda Ash • Para-dichlorobenzene • Ortho-dichlorobenzene • Carbon Tetrachloride Ammonium Bicarbonate • Snowflake® Crystals • Aluminum Chloride • Cleaning Compounds • Hydrogen Peroxide • Mutual Chromium Chemicals

Allied Chemical

SOLVAY PROCESS DIVISION
61 Broadway, New York 6, N. Y.

SOLVAY dealers and branch offices are located in major centers from coast to coast.

SOLVAY PROCESS DIVISION
61 Broadway, New York 6, N. Y.

Please send without cost SOLVAY Caustic Soda sample or samples and literature as follows:

☐ 76% powdered ☐ 76% solid ☐ 76% ground ☐ 76% flake
☐ 76% small flake ☐ 50% liquor ☐ 73% liquor ☐ 50% mercury cell liquor ☐ 73% mercury cell liquor
☐ Technical Bulletin No. 6, "Caustic Soda"
☐ Wall chart of handling precautions

Name _____

Position _____

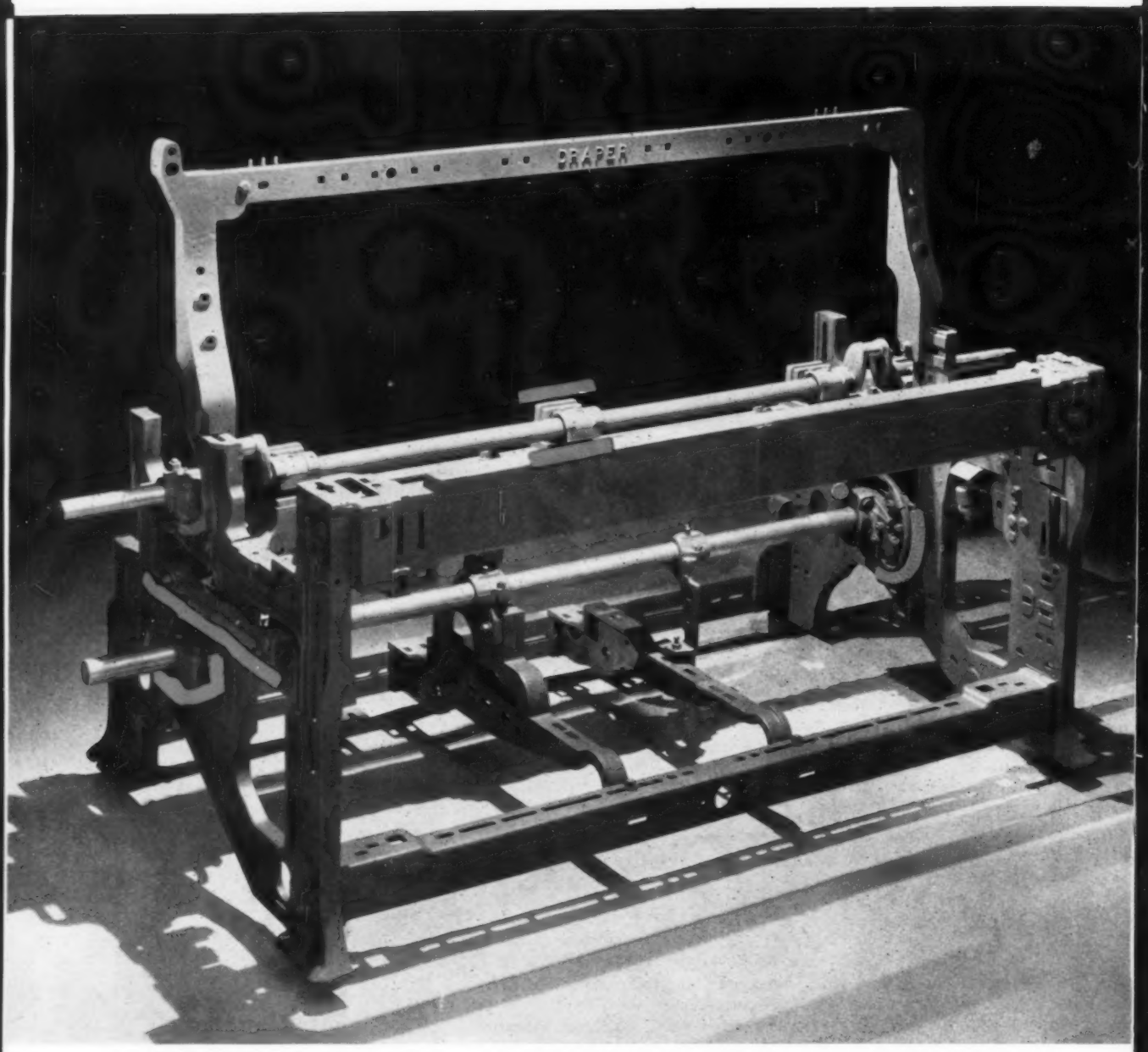
Company _____

Phone _____

Address _____

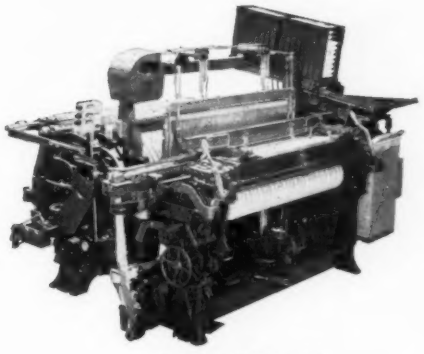
BQ-88

City _____ Zone _____ State _____



RIGHT FROM THE START! Since loom efficiency is, to a large extent, dependent on the individual performance of many parts, it is important that they be correct and properly applied. Each Draper part and mechanism is designed and built with one objective in mind . . . to give the maximum in service and dependability. — *Regular checks and replacement of worn or mongrel parts,* with *Draper Improved Repairs,* guarantee getting the most out of your looms.

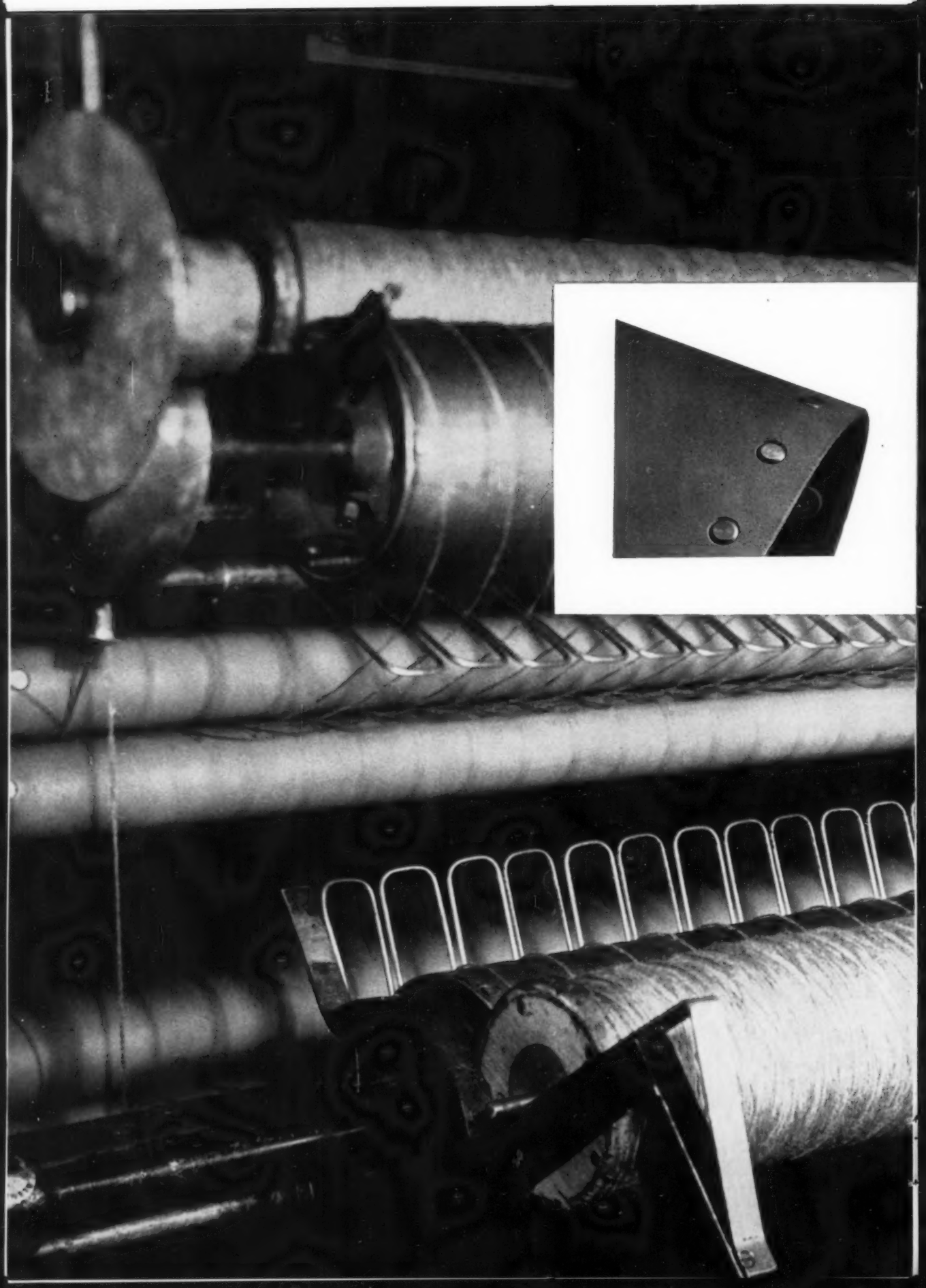
Illustrated are but a few of the many DRAPER IMPROVED REPAIRS *which enable you to produce more goods for less cost.*



DRAPER MODEL X-2
HIGH SPEED LOOM

DRAPER CORPORATION

HOPEDALE, MASS. • ATLANTA, GA. • GREENSBORO, N.C. • SPARTANBURG, S.C.



Tough . . . 2-ply

Dayco Rub Aprons

Lower Your Carding Costs

SAVINGS MOUNT UP when you figure that Dayco Rub Aprons completely eliminate the cost—at approximately $25.00 an hour—of oiling the aprons when your cards are stripped. And the dimes and quarters you save here and there—because Dayco Rub Aprons need less routine maintenance—soon add up to the cost of the aprons themselves. Besides, what a difference Dayco Rub Aprons make in the quality and uniformity of your yarn!

LONGER LASTING Dayco Rub Aprons are doubly reinforced with two plys of tough-rubber impregnated fabric. This extra strength not only gives Dayco Aprons greater stamina under constant flexing . . . it reduces eccentric motion by 33%! Naturally, buttons stay fixed in an apron as tough as this.

YARN QUALITY is always consistently high for the texture of Dayco Aprons never varies. Maintaining the highest coefficient of any apron available, Dayco Rub Aprons never become slick or glazed, are immune to changes in temperature and humidity, and are unaffected by emulsion oils which cause *surface growth* in other aprons. As a result, yarn quality never varies—day in, day out, month after month.

TROUBLE-FREE Dayco Aprons have an extra-deep synthetic surface which resists the abrasive action of constant rubbing. Since they require no oiling, maintenance is simplified and card downtime virtually eliminated. Nor do Dayco Aprons require frequent adjustment. Perfectly concentric, they hug the rolls tightly for accurate tracking and a positive, non-slip drive at all times.

DAYCO ENDLESS CONDENSER TAPE

Features offering additional savings . . . greater card efficiency:

- No stretch—little need for take-ups
- Less tendency to twist or turn over
- Easy to clean—require less attention
- Unaffected by oil or static
- Will not crack, economical, efficient

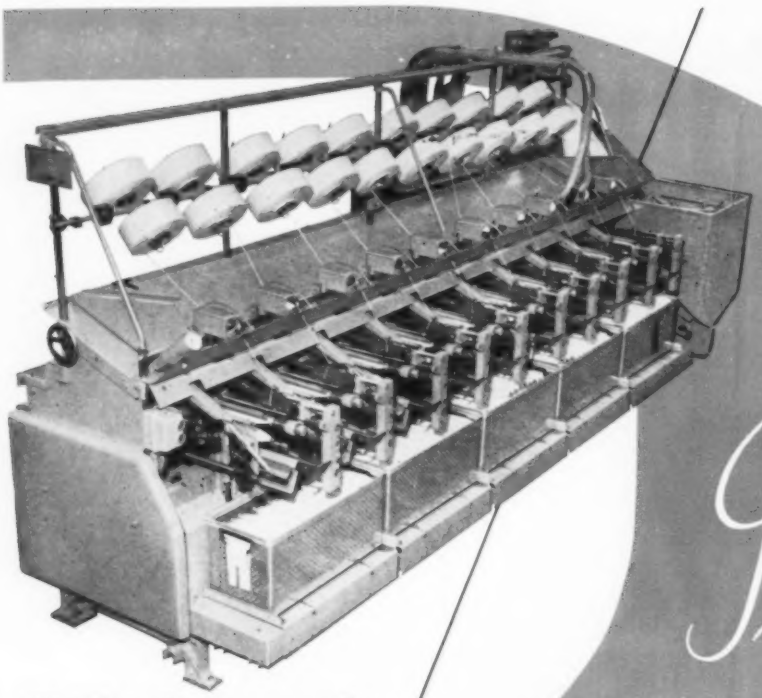
Next time he calls, ask your Dayco representative for an estimate of the savings Dayco Rub Aprons can make in your mill. Or write the Dayton Rubber Co., Textile Div., 401 S. C. National Bank Building, Greenville, S. C.

Dayton Rubber

© D. R. 1958

OVERSEAS PLANT, THE DAYTON RUBBER CO. LTD., DUNDEE, SCOTLAND

Dayco and Thorobred Textile Products for Better Spinning and Weaving



The High Speed Scharer QUILLER

Fully Automatic . . . but simple to operate and maintain

Speeds up to 11,000 R.P.M.
Simplicity of design assures lowest maintenance cost
Patented no-tailing device completely eliminates tails on full bobbins
Produces uniform bobbins with more yarn per package
Special tension control prevents yarn sluffing off
Full bobbins laid uniformly into boxes and ready for use at looms
Operators can handle more spindles and wind more yarn than on any other modern high speed quiller
Exclusive combination blower and vacuum keeps machine and yarn cleaner
Only one motor used to operate entire machine and blower
Automatic loading hopper, handles quills without damage
Ample stocks of replacement parts carried in our Spartanburg Warehouse

Manufactured By: Scharer Textile Machine Works, Erlenbach/Zurich, Switzerland

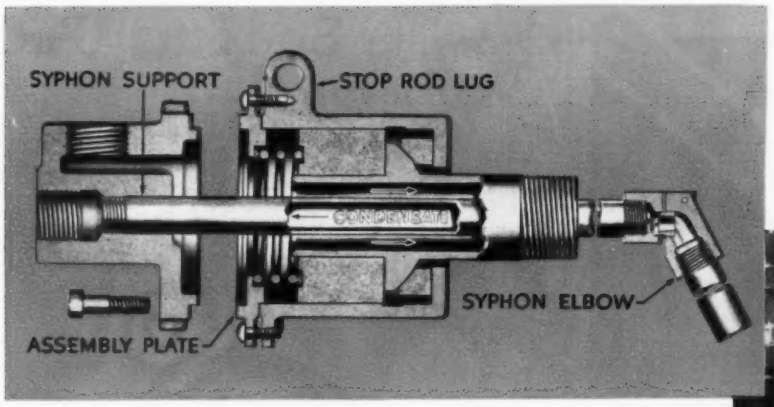
"Winding Machines Since 1880"

Sold and Serviced in the United States by:

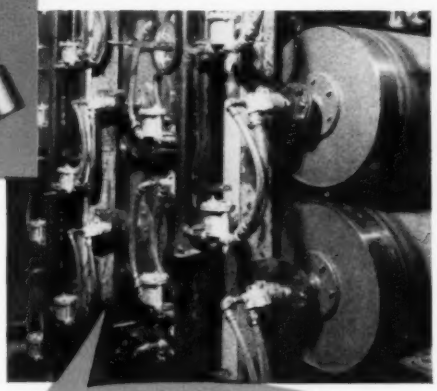
Yeomans
Textile Machinery Company
P. O. Box 1661, Spartanburg, S. C.

On Display in Annex No. 8, Southern Textile Exposition

Sole Scharer Agents in Canada: Hugh Williams & Co., 27 Wellington St. E., Toronto 1, Ont.



TYPE S-B2P Johnson Joint with Syphon Elbow. This is a completely self-supporting unit, and like all Johnson Joints has no packing, needs no lubrication. Installation picture shows Type S-B2P Joints on dry cans in southern mill.



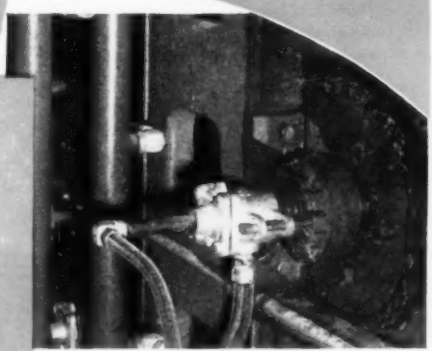
Best thing that's happened in a long time ...for Dry Cans, Slashers and Print Cans

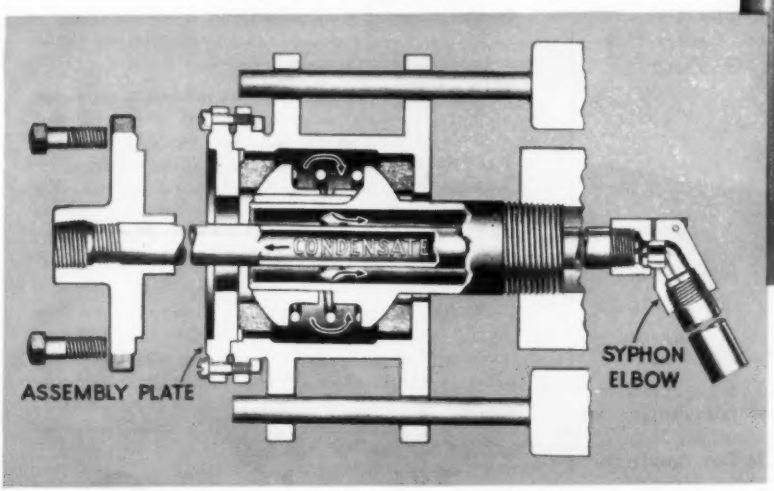
What's happened is this. To match the efficiency of the Johnson Joint for getting steam into cans and rolls, Johnson has developed a mechanical syphon elbow for the job of getting condensate out again. It permits the use of two straight pipes for the syphon pipe . . . is hinged to pass right through the joint . . . seats of its own weight when in position. A special assembly plate is provided on the joint to permit removing the head, and syphon pipe, without disassembling the joint.

Try it yourself—Thousands of installations have proved the two combinations shown are particularly suited for the textile industry. Whatever your needs, we will gladly furnish a pair of units for 90-day trial in your own mill, without cost or obligation.

Write for full information

JOHNSON *Rotary Pressure* JOINTS with JOHNSON SYPHON ELBOWS





TYPE LJ Johnson Joint with Syphon Elbow. Has lugs on body for support rods, which carry all weight of body and connections, permit rotating assembly to "float" freely inside. Steam inlet is in side of body, as shown in installation view.

THE JOHNSON CORPORATION

815 Wood Street, Three Rivers, Michigan

Rotary Pressure Joints • Direct Operated Solenoid Valves

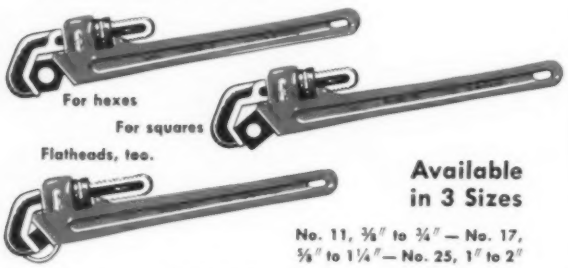
Pat. Applied For

New **RIDGID**

Hex Wrench

gives you Time-Saving, Positive, 4-Sided Grip on Hex Nuts, Square Nuts, Valve Packing Nuts, Unions, Gas Cocks

Here's the adjustable wrench you've always needed for hexes, squares and flatheads, rough or finished. Extra useful on every job. No more barked knuckles or rounded nut shoulders. New wide-open jaw goes on easy . . . won't slip off. 4-sided grip gives extra leverage. Stays to adjusted size during use.



Available in 3 Sizes

No. 11, 3/8" to 3/4" — No. 17, 5/8" to 1 1/4" — No. 25, 1" to 2"

Famous RIDGID heavy-duty construction with guaranteed housing. Narrow jaw design makes work easy in tight places even on thin nuts. Comfort-grip I-beam handle has handy hang-up hole. The new RIDGID Hex Wrench gives you more for your money than wrenches costing twice as much. Try it, buy it at your Wholesaler's.

The Ridge Tool Company • Elyria, Ohio, U.S.A.

Ordering Sodium CMC or anionic detergents?

(ONLY TRULY REFINED, TECHNICAL GRADES, IF YOU PLEASE)

. . . then find out about Wyandotte's Carbose* and Kreelon* CD

Wyandotte CARBOSE (Technical Sodium CMC) overcomes many of the disadvantages of other film-forming materials used for warp sizing. CARBOSE has greater stability; sizes the warps without stiffening them; is quickly and easily desized; and being synthetic, gives a uniform performance every time.

Wyandotte's KREELON CD, an inherently promoted alkylarylsulfonate, is recommended where efficient detergency, wetting and rinsing are required. KREELON CD does a superior job in scouring, kier boiling, after-soaping, and finishing operations for cotton. For efficient scouring, carbonizing scouring, carbonizing and dyeing of raw wool . . . scouring, desizing, and bleaching of silks and synthetics . . . specify inclusion of KREELON CD.

Both CARBOSE and KREELON CD are available from distributor stocks in all principal cities. For technical assistance or product data, call our nearest branch office or write: *Section TI, Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

*REG. U.S. PAT. OFF.

Wyandotte CHEMICALS

MICHIGAN ALKALI DIVISION

Textile people are talking about . . .

Emulsifiable A-C® Polyethylene

best for finishes!

"I'm getting wash and wear finish advantages with A-C Polyethylene I never dreamed possible . . . and all at a low *finishing cost!*"

"I like A-C Polyethylene because I can use it on *anything*: Blends, Wool, Rayon, Silk, Acetate, Orlon, Dacron, other Synthetics, Cotton—anything!"

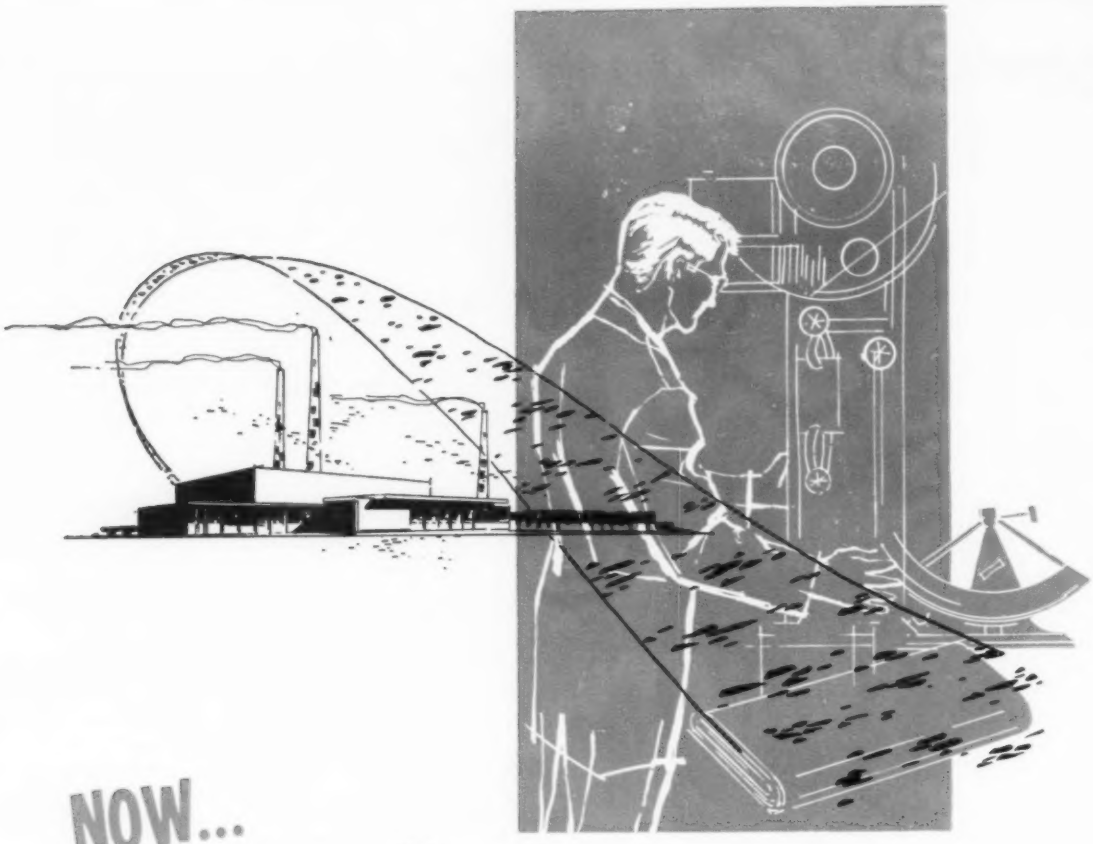
"I'm getting higher abrasion resistance, increased tear strength and improved sewability, to name only a few advantages. I'm 'sold' on A-C Polyethylene compounded finishes!"

"I like the reduced needle cutting, better lubricating qualities and non-chlorine retention features of A-C Polyethylene."

"I used to think all polyethylenes were the same but tests prove that Emulsifiable A-C Polyethylene for finishes is in a class by itself. It makes high concentrates, a small particle size and storage-stable emulsions."

SEMET-SOLVAY PETROCHEMICAL DIVISION
DEPT. 522-AW, 40 RECTOR STREET
NEW YORK 6, NEW YORK

Allied Chemical



NOW...

not only OUR products, but also our CUSTOMERS products are LABORATORY TESTED

The finishing plant without specific facilities for testing resin-treated fabrics can now maintain quality and be assured of meeting specifications.

Samples for all lots finished with our line of thermo-setting resins may be sent to our TEXTILE TESTING DIVISION. Complete test reports will be furnished promptly to the mill, together with suggestions for any necessary improvement in quality.

This is just another facet of our CUSTOMER SERVICE PROGRAM, available to all formulators of crease-resistant, "wash-wear", schreinered, embossed, and glazed finishes.

Send for samples of our resins together with mill-tested finishing formulae, and let us send you a sample report on your test runs.

HARTOSET E—A highly stable and efficient monomeric etherified urea resin, giving excellent stabilization and soft hand.

HARTOSET P—A stable polymeric etherified urea resin for stabilization with crisp hand.

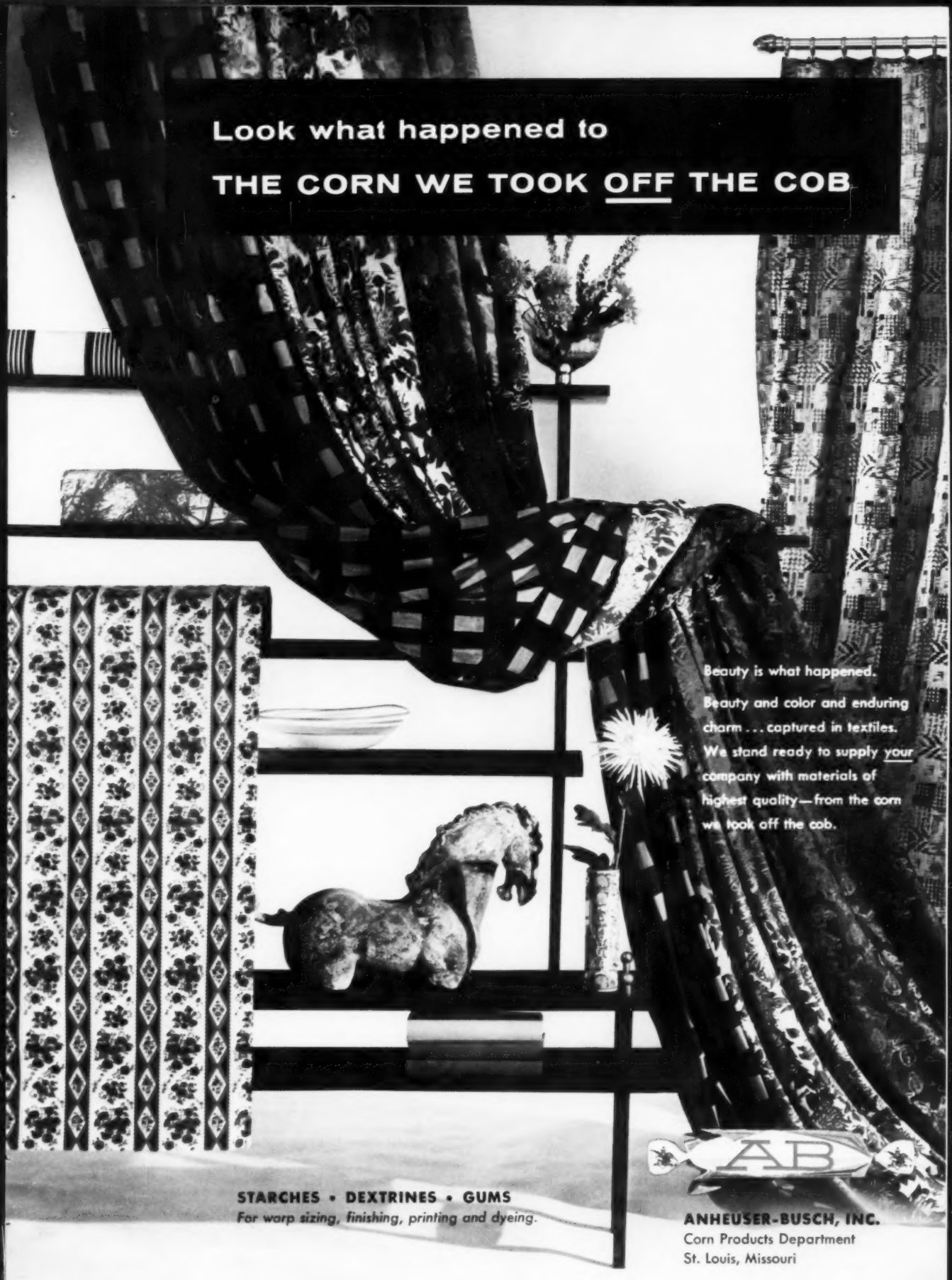
HARTORESIN S50—A stabilized, high-solids urea-formaldehyde syrup.

HARTOSET F60—A crisp, flame-retardant finish for nylon nets.

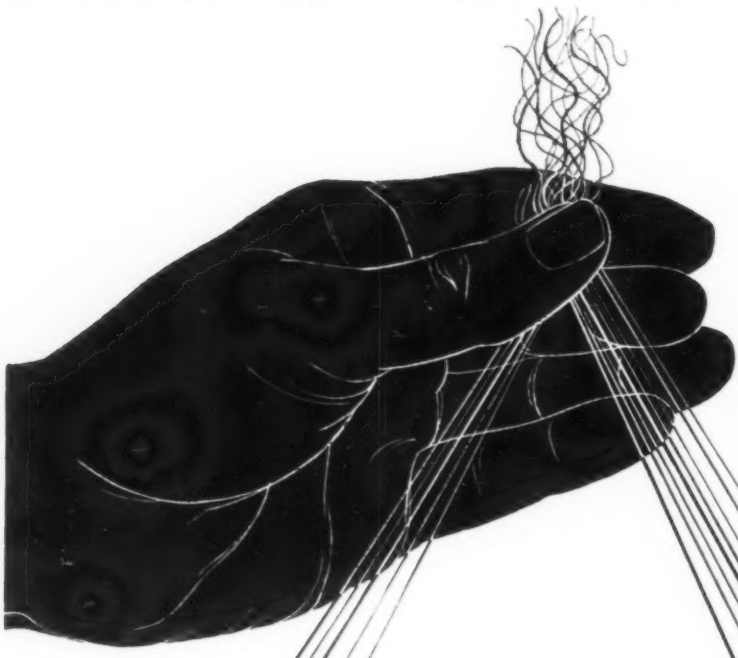
the Hart Products Corporation

1440 BROADWAY, NEW YORK 18, N. Y.

Works and Laboratories, Jersey City, N. J. Hart Products Company of Canada, Ltd., Guelph, Ontario


Look what happened to
THE CORN WE TOOK OFF THE COB
Beauty is what happened.
Beauty and color and enduring charm . . . captured in textiles. We stand ready to supply your company with materials of highest quality—from the corn we took off the cob.
AB
STARCHES • DEXTRINES • GUMS
For warp sizing, finishing, printing and dyeing.
ANHEUSER-BUSCH, INC.
Corn Products Department
St. Louis, Missouri

A SKILLED HAND IN CHEMISTRY . . . AT WORK FOR YOU



NOPCOSTATS*

make your fibers behave

A unique series of fiber lubricants for synthetic fibers and blends†

Nopco, in a cooperative effort with the fiber producers and the tow-to-top convertors, has developed a series of antistatic lubricants called Nopcostats which will meet all synthetic fiber finish needs.

The Nopcostats are a set of tools that allow you to change the draw characteristics of your fibers in order to achieve the necessary balanced processing requirements. They are a highly potent series of lubricants which accomplish results in amounts of from ¼ to 1% o.w.f.

*Nopcostat is a registered trademark of Nopco Chemical Company.

†Nopcostats are also available for wool fibers and yarns and for yarns processed on the woolen and worsted systems.

	Products			
	Nopcostat AS-40	Nopcostat LV-40	Nopcostat 2152-P	Nopcostat 2152-X
	Fibers			
	Acetate Viscose Arnel[1]	Vicara[2] and acrylic types such as Orlon,[3] Dynel,[4] Acrilan,[5] etc.	Nylon Dacron[3]	Nylon Dacron
Interfiber friction	Low	Medium	High	High
Fiber-to-metal friction	Medium high	Medium	Low	Low
Antistatic effect	Excellent	Excellent	Excellent	Excellent

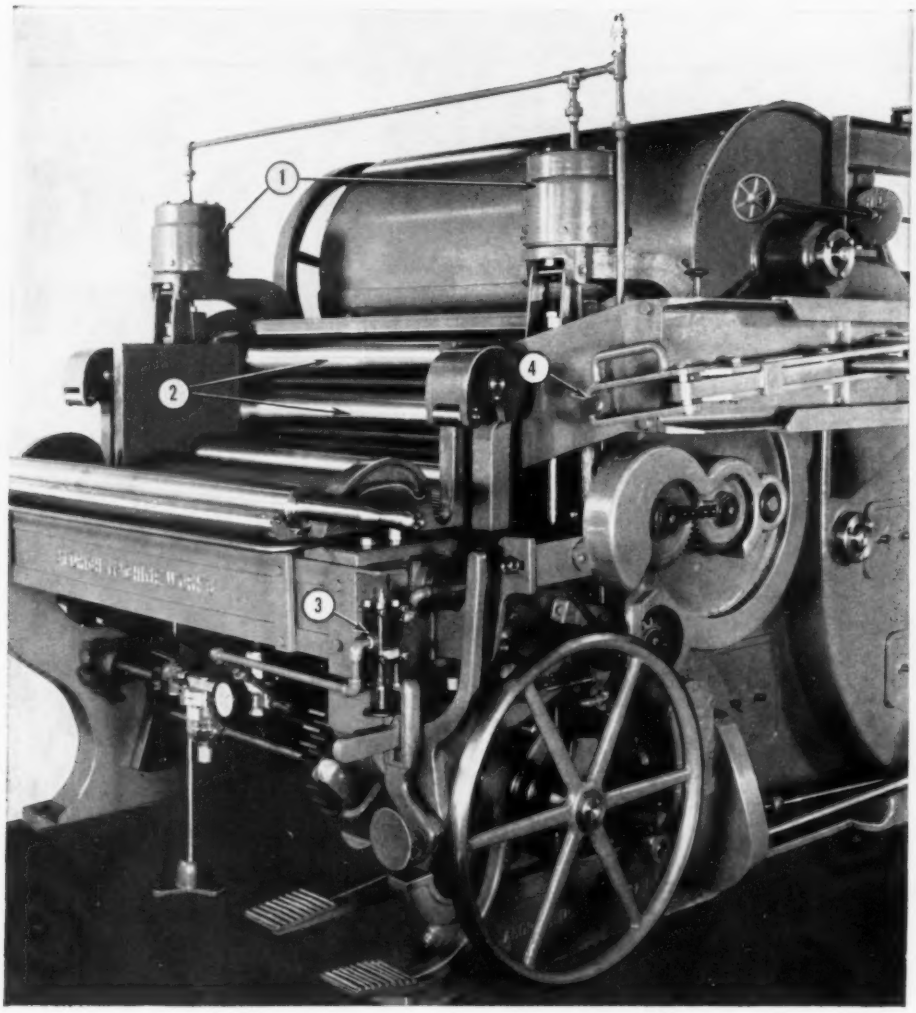
[1] Registered trademark of Celanese Corp. of America
[2] Registered trademark of Virginia-Carolina Chemical Corp.
[3] Registered trademark of E. I. du Pont de Nemours & Co., Inc.
[4] Registered trademark of Carbide and Carbon Chemical Co.
[5] Registered trademark of Chemstrand Corp.

When you want a specific lubricant for a specific job, you will find the right formulation in the Nopcostat series. Write today to Nopco, a pioneer in fiber lubricants to obtain a new bulletin describing the complete Nopcostat line and methods of application. Nopco Chemical Company, Textile Chemicals Division, 60 Park Place, Newark 2, N.J.

NOPCO®

Vital Ingredients for Vital Industries

Plants: Harrison, N.J. • Richmond, Calif. • Cedartown, Ga. London, Canada



The ALDRICH HIGH COMPRESSION CALENDER

1. Diaphragm air cylinders, without pistons or stuffing boxes, apply accurately adjustable pressures up to 12,000 pounds on the calender rolls.

2. Meehanite calender rolls, which are stronger than grey cast iron, and smoother, since there are no blow holes in Meehanite castings. These rolls are carried on roller bearings, made to fit standard calender rolls with full-sized journals to permit easy installation and provide maximum carrying capacity.

3. Valve which releases pressure on the rolls *each* time the calender stops. This is very important on some synthetics.

4. Pneumatic Lap Pin Extractor which applies a pull of 800 pounds to the pin to remove it from the densest lap.

AldricH MachinE WorkS
Greenwood, South Carolina

BECCO

SINGLE STAGE

BLEACHING

How 30 years of textile experience can help you

As an example, look what's happened to Single Stage bleaching processes. Over the years, Becco research has improved single stage bleaching to the point where it is in economical commercial use for both continuous and batch bleaching operations (J-box or kier).

In this connection, Becco has developed more efficient pretreatments, making possible substantial chemical cost savings when using a single H_2O_2 bleaching step.

Where production requirements, available equipment, or space limitations demand a single stage process, Becco can thus recommend the most efficient and economical procedures for you.

Fact is, whatever your particular requirements may be, Becco can offer the latest in

Single Stage • Multi Stage • Silicate Free & Ultra-Rapid bleaching processes

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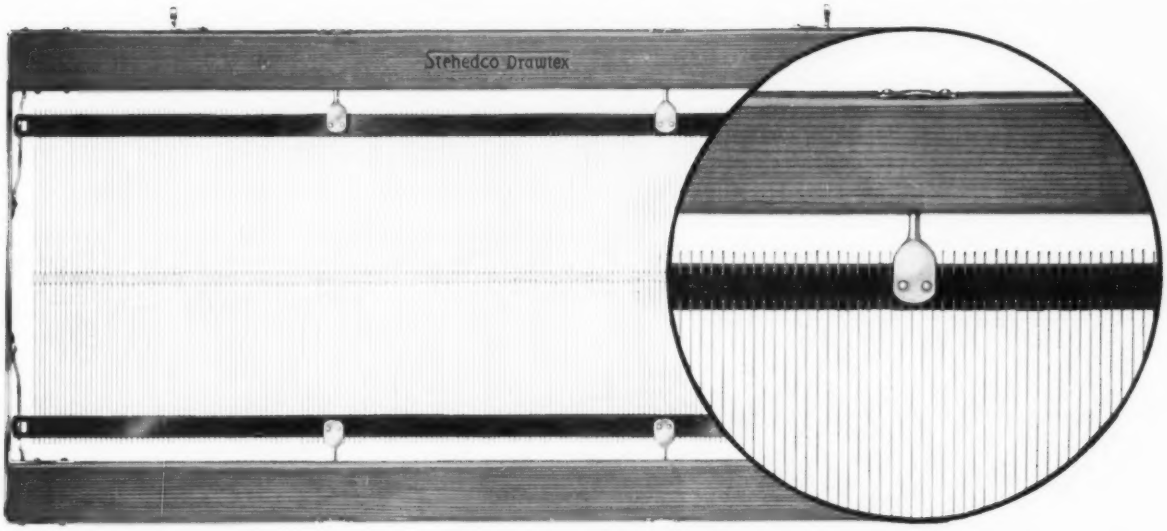
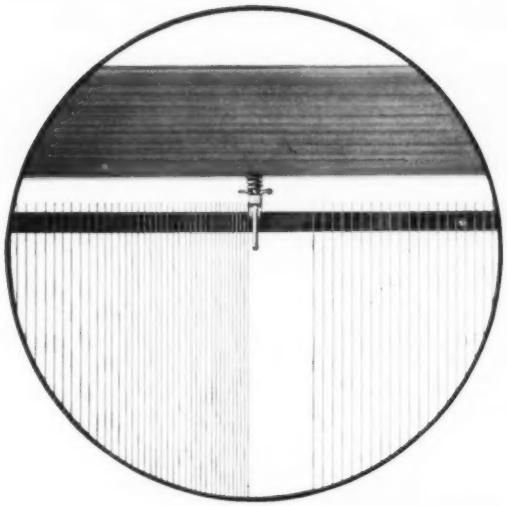
DRAWTEX HARNESS
IMPROVES EFFICIENCY AND QUALITY WITH PERFECT HEDDLE SPACING



Are your weavers and fixers handicapped by bunching of heddles at rod supports, as illustrated below?



Stehedco Drawtex rod supports allow completely free movement of the heddles. There is no obstruction to keep the heddles from finding their natural position on the rod. Therefore, warp streaks from heddle bunching are completely eliminated and down time to correct this condition is a thing of the past.

This is only one of many Stehedco Drawtex advantages. Ask our sales engineers to tell you all about them.

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Whether your Sulfuric Acid requirements are an occasional tank car or large tonnages, check with Tennessee before making your decision. You will find our acid attractively priced, high in quality, consistently available and backed by outstanding customer service gained through years of growth and experience.

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Because of the great strength of Tex-Hide—a product of Gates *specialized* research—the block can be molded into the strap without the use of bolts or rivets. As a result, straps are streamlined and light in weight.

Yet, because of their superb resilience, they will give you longer service, and smoother operation, *than any other strap you have ever used.*

2 big advantages of Gates Tex-Hide Lug Straps

1. Tex-Hide Lug Straps combine great strength with unsurpassed resiliency. Therefore, they soak up blows and shocks *without taking any permanent stretch.*

2. The great resiliency also insures long life for *all parts* of the picking motion, and gives extended periods of operation *without any strap adjustments.*

Super Tex-Hide Lug Straps

Users report up to 5 times longer service on their heaviest looms from Super Tex-Hide than from any other strap.

New Thin-Tex Lug Straps

When extreme flexibility and much lighter weight are needed, Thin-Tex Lug Straps give up to 25% longer life than ordinary straps...and smooth out loom operation.

Gates Distributors are in the Yellow Pages

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The Gates Rubber Company, Denver, Colorado

The Mark of *Specialized* Research

Other Products...

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Spinning Frame Drives

Tex-Hide Harness Straps

Tex-Hide and Vulco Loop Pickers

Reversible Pickers

PA 325

Gates Lug Straps

Armstrong Accotex Cots can help you keep yarn quality high

Accotex Cots can help you get maximum production of top-quality yarn from your high-draft frames by minimizing such sources of trouble and expense as lapping, eyebrowing, and irregularities caused by poor yarn control.

The broad line of Armstrong Accotex Roll Covers includes materials that are specially compounded to combat these common spinning problems.

For example, many mills have found that they can reduce front roll laps to a minimum with Accotex J-490 Cots. This cot contains electrolytes that actually tend to repel broken ends and prevent them from lapping.

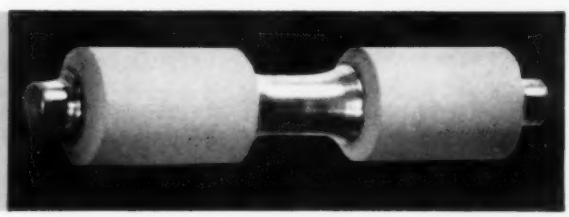
In mills where high static aggravates the lapping problem, one of the new anti-static Accotex materials is often the answer. These new cots are made especially to help control front roll lapping on equipment where non-metallic cap bars are used and where other metal-to-metal contacts have been eliminated.

Excessive eyebrowing in spinning room and card room has been eliminated in many mills by another Accotex anti-static material—NC-762. This new cot has an exclusive "constant-friction" surface that packs waste well back under the clearers. In addition, many mills report substantial reductions in the total amount of waste formed where the anti-static NC-762 cot is used.

With some types of equipment, it has been found that one of the softer Accotex Cot materials will improve break strength and reduce irregularities in the yarn.

Your Armstrong representative will be glad to work with you in the selection of the right roll covers for best performance on your equipment. Call him today or write Armstrong Cork Company, Industrial Division, 6508 Ivy Street, Lancaster, Pennsylvania.

No matter what fiber or blend you're spinning, no matter what kind of equipment you have, there's an Accotex Cot that's specially designed to help you get top-quality spinning.



Armstrong ACCOTEX COTS

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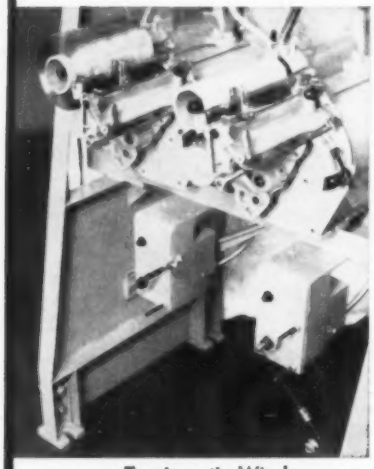
FOSTER TAKEUP WINDERS

For Melt-Spun, Wet-Spun and Dry-Spun Synthetic Fibre Yarns

Model 403
for Melt-Spun Yarns

Long Experience in the Field

We have had long experience in the design and manufacture of takeup winders for melt-spun, wet-spun and dry-spun synthetic fibre yarns. We have made and are now making machines of this type for leading producers of synthetic fibres. We illustrate herewith the two types of machines and describe briefly how they operate.



Tensiomatic Winder
for Wet-Spun and Dry-Spun Yarns

MODEL 403

For continuous winding of synthetic melt-spun yarns direct from spinneret at speeds up to 6000 ft. per minute. Yarn (15 to 1200 drawn denier) travels from spinneret down through heated chimney over finish rolls, with ceramic guides under each to maintain proper arc of contact, to a series of Godet feed rolls, delivering the yarn to a reciprocating traverse guide (actuated by independently driven traverse cam) and to the package core, which is driven by a chrome plated steel roll. Pressure of package on roll automatically adjusted as its weight increases. One 5¼" traverse package, two 3¼" traverse packages, or four 1" traverse packages per holder. Drive roll shaft and feed rolls driven by separate synchronous motors. Ribbon wind is eliminated. 16" gauge, 56 spindles with 2 independent drives (28 spindles each).

TENSIOMATIC WINDER

For continuous winding of wet-spun or dry-spun synthetic yarns direct from spinneret to 6" traverse packages (1 or 2 packages per position) or to 10" traverse packages weighing up to 30 lbs. Speeds up to 450 feet per minute. Precise wind machine. As package builds up and yarn speed increases, speed of motor is automatically and proportionately decreased by means of dancer rolls and an electronic control device.

Our Engineers Will Work With You

If you are developing a new synthetic fibre, it will pay you to consult our engineers regarding your winding requirements. They are familiar with your problems and can custom design a machine to your requirements.

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European Representative — Muschamp Textile Machinery Ltd., Keb Lane Bardsley, Oldham, Eng.

293-B

For achievements in dyeing specific synthetics... see SANDOZ

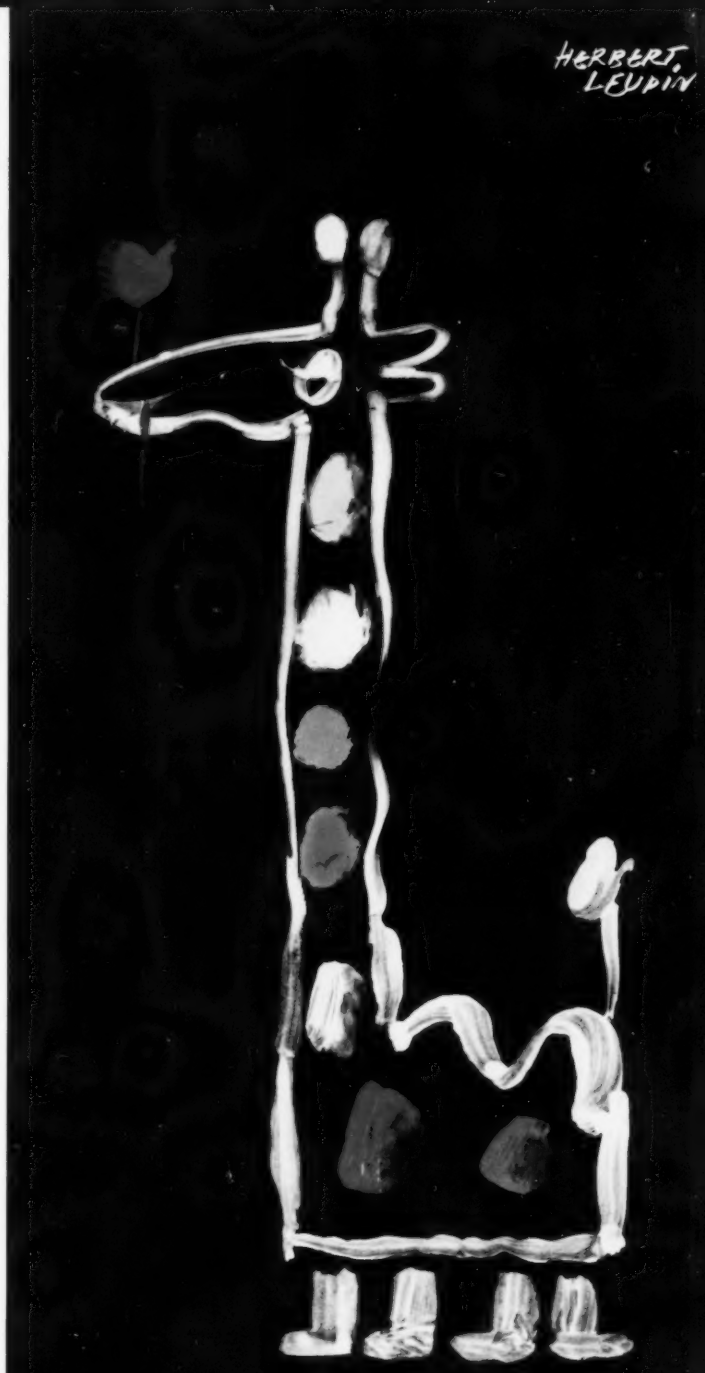
When a new synthetic fiber comes into the dyehouse, the dyer's problem is to adapt his colors and equipment to it. The technical assistance of a fast moving, reliable dyestuff manufacturer often makes the difference between success or failure.

On filament nylons and Acrilan,* for example, the SANDOZ laboratories within the past 12 months have added the following accomplishments to their record:

(1) Heat textured filament nylon dyed without barré effects; polyester and acrylic fibers white; using selected dyes in the Sandonyl/ Lyogen P formulations. (2) Nylon carpeting piece dyed level and colorfast, nylon carpet yarn dyed successfully in a Hussong machine—using the Lanasyn series of neutral dyeing premetallized colors, and appropriate leveling agents. (3) Acrilan—a new idea in carpeting—dyed with controlled change of shade in artificial light; with fastness of 60-80 hours in light tests, through use of the Lanasyn and Lanasyn Brilliant line of dyes, plus Lyogen P.

For color achievements from SANDOZ, call or write: SANDOZ, INC., 61-63 Van Dam Street, New York 13, N.Y., ALgonquin 5-1700.
District Offices: Charlotte, Cincinnati, Fair Lawn, N. J., Hudson, Mass., Los Angeles, Philadelphia.

*T.M. The Chemstrand Corp.



SANDOZ

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A sampling of companies now using Proctor Textile Processing Equipment:

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Amerotron Corp.
Anglo Fabrics Co.
Joseph Bancroft & Sons Co.
Bigelow-Sanford Carpet Company
Burlington Industries, Inc.
Chatham Mfg. Co.
Cone Mills Corp.
Consolidated Bleaching Co.
Deering-Milliken & Co.
P. H. Hanes Knitting Co.
A. & M. Karagheusian
The Kendall Company
Jas. Lees & Sons Co.
Magee Carpet Co.
Mohasco Industries, Incorporated
Pellon, Inc.
Fairlawn Finishing Co.
Rock Hill Printing & Finishing Co.
Simmons Company
J. P. Stevens & Co., Inc.
United Merchants & Manufacturers, Inc.

All of these products are processed with Proctor Preparatory and Blending equipment in addition to the specialized machines listed below.

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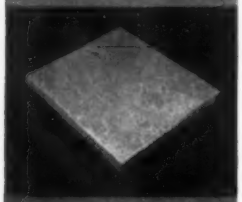
- Loop dryer—curer
- Tenter Housing
- Roller Curer

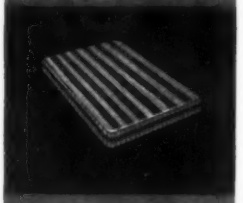


CARPETS
WOVEN AND TUFTED
- Carding
- Drying

KNIT GOODS
- Continuous Bleach Range
- Nylon Setting and Drying Equipment
- Loop dryer
- Redmanized® "shrunk-to-fit" finishing
- Electrocolorset for dyeing, setting, and finishing nylon hosiery

WOVEN SYNTHETICS
- Synthetic card
- Resin finishing ranges

BLANKETS
- Stock dryers
- Carding



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NON-WOVENS
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MANUFACTURERS OF TEXTILE PROCESSING MACHINERY AND INDUSTRIAL DRYING EQUIPMENT

Textile Industries
for August 1958

News IN BRIEF

How Do Your Fabrics Behave for Drycleaners? 31.3 per cent of the complaints handled by the National Institute of Drycleaning's textile analysis department last year were determined to be due to fabric behavior. Of the 3746 complaints, 1262 were because of color less in drycleaning (pigment-resin and lacquer prints), 906 silk warp breaks (splits), 1290 fading and/or fiber tendering from sunlight, and 288 fume fading.

To Make Nonwoven Garments. Textile Products Co. of Newark, N. J., has announced plans to open a division to manufacture disposable garments from nonwoven cotton fabric and nylon-reinforced cellulose wadding. Hats, shirts, pants, coveralls, laboratory coats, aprons, and shoes, principally for radio-active enterprises and hospitals, will be made. All products will be assembled by sewing.

Cotton bed sheets that need no ironing are being marketed by the Pequot Division of Indian Head Mills, Inc. Sold under the Pequot "E-Z Care" brand name, the sheets (with matching pillow cases) have a wrinkle-resistant, non-chlorine retentive finish that produces a smooth appearance without ironing, regardless of the way they are washed and dried, the company said. Effectiveness of the finish is shown in the above unretouched photo. Both sheets, made of the same cotton fabric, went through the same washing and drying process together and then were placed on the beds. On the right is the Pequot "E-Z Care" sheet and pillowcase. According to Indian Head Mills president James E. Robison, this is the first time that a no-iron finish has been successfully applied to sheets and pillow cases.

TWUA Blames Southern Mills for Drive Failure. Textile Workers Union of America has charged that a number of southern textile mills illegally marshalled business, civic, and even religious forces to beat back union organization efforts, a report of a Senate Labor Subcommittee hearing indicates. The committee, which was considering proposals for amendment of the Taft-Hartley Act, received these recommendations from the union spokesman who made the charge: (a) restrict activities of civic officials and others acting as management agents; (b) authorize mandatory injunctions against unfair labor practices; (c) abolish "free speech" right of management during organizing drives because employers use these rights to coerce workers; (d) provide speedy determination of representation claims; (e) reinstate the pre-Taft-Hartley practice of conducting pre-hearing elections.

European Tour for Southern Mill Men. A European tour for southern textile manufacturers and their wives who plan to attend the International Textile Machinery and Accessories Exhibition in Manchester, England, in October, has been arranged by World Travel Service, 701 S. Tryon St., Charlotte 1, N. C. Besides allowing four full days for the Manchester exhibition and two days for the Brussels World's Fair, the 33-day tour features visits to eight countries and the opportunity to visit textile plants in England, Germany, Switzerland, and France. Junius M. Smith, president of Clark Publishing Co., will accompany the group and be in charge of visits to the mills.

Retain Duties on Unfinished Cotton Cloth, ACTM Urges. Elimination from the proposed revised and consolidated tariff schedules for textile fibers and textile products of the minimum specific duties on unfinished cotton cloth was protested in a recent statement of the Association of Cotton Textile Merchants of New York. While the minimum specific duty has been

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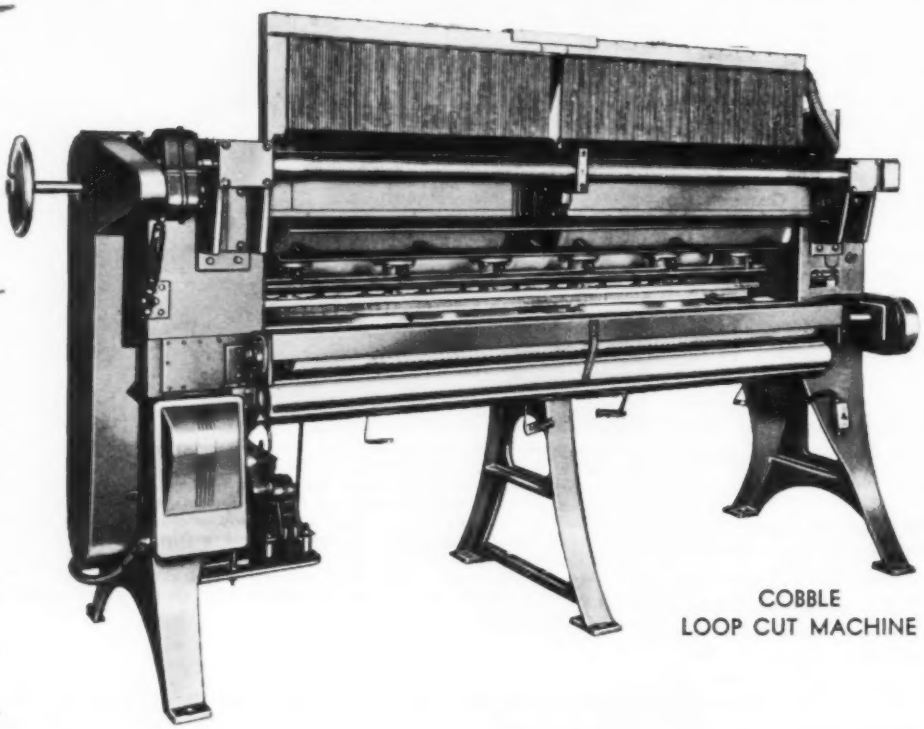

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International Textile Machinery
and Accessories Exhibition

Belle Vue, Manchester, England — Oct. 15th to 25th

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scaled down in recent years to 0.3 cents per average yarn number per pound, the Association explained, its continuance from the existing to the proposed new simplified schedules is necessary because of continuing expansion of textile production in very low cost areas of the Far East, and as an automatic check against dumping of merchandise from abroad in the American markets.

Ga. Mill Men Change Meeting Date. The fall meeting of the Textile Operating Executives of Georgia has been changed from October 11 to November 8 to avoid conflict with the Greenville Show, according to an announcement from Herman A. Dickert, secretary-treasurer of the organization.

Canadian Textile Seminar. The sixth Canadian Textile Seminar will be held September 11 and 12 at Queen's University, Kingston, Ontario. The program schedules 27 technical papers, 14 of which will

be presented by U. S. authors. The seminar divides into seven sections, each with its own chairman, as follows: fiber development, yarn preparation, fabric manufacturing, wet processing, mill management, quality control, and mill engineering.

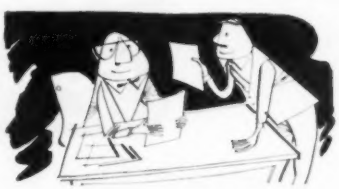
Wool Cloth Imports Threat to Canadian Mills. Present tariffs on imported wool fabrics are insufficient, according to George H. Dobbie, president of the Canadian Woollen & Knit Goods Manufacturers Association. In Mr. Dobbie's view, imports from Italy pose a steadily growing threat to the existence of Canadian wool mills. Three years ago these fabrics were practically unknown in the Canadian market, but now they are coming in at the rate of 2.3 million yards each year, he pointed out. Mr. Dobbie said that the United Kingdom is still the largest supplier of imports to the Canadian market, but Italy has replaced Great Britain as the world's largest exporter of wool cloth.

TWUA Urges Teamwork to Aid Sick Industry. William Pollock, president of the Textile Workers Union of America, urges teamwork between Government, management, and labor to help end in-

dustry problems. During the union's 10th biennial convention at Miami Beach, Fla., Mr. Pollock stated that the Government is now showing signs of becoming interested in the sick industry, that the union stands ready to participate in efforts to solve matters, but that management is "still living in the past."

ATMA to Broaden Membership Scope. The American Textile Machinery Association has amended its constitution and by-laws to include as members those firms manufacturing knitting machinery, thus establishing a new division. The Association has also adopted an amendment setting up an associate membership for any individual, firm, or corporation, located in the U. S. whose principal business, in the judgment of the board, is the manufacture of parts for or machinery accessory to machines for actual manufacture of yarn, woven or knitted fabrics, finishing or dyeing equipment.

NKOA Institutes Utility Service. The National Knitted Outerwear Association has added a new service, free to members, designed to help reduce utility costs of member companies. Members submit their paid utility bills for the past



year to the Association. These are sent to a utility rates expert for analysis to determine whether the most favorable rate is being applied. Substantial savings are reported to have resulted in some instances.

News in Brief

Rug Styling Firm. A rug styling firm, said to be the only such operation of its kind, has been established with offices in Dalton, Ga. and New York City. Known as Noxon Rug Mills, Inc., the new firm will not manufacture carpeting, but will render a service of styling and creation for several manufacturers. From the main office in Dalton, the firm's president, Ira N. Nochumson, explained that the service will include giving the manufacturer assistance where needed in producing the goods, then helping by coordinating efforts to expedite shipments.

Vat Dye Booklet. "The Story of Vat Dyes," a new 16-page educational booklet about vat dyes, their development, use in the textile industry today, and signifi-

cance to the consumer, has been issued by The Vat Dye Institute. The factual booklet is prepared in easy to understand, non-technical language for interested trade and consumer groups. Offered as a public service as part of its continuing educational campaign on the subject of vat dyes, the booklet is available upon request to the Vat Dye Institute, Inc., Empire State Building, 350 Fifth Avenue, New York 1, N. Y.

Wool Mills Used Less Fiber in '57. Total fiber consumption on woolen and worsted systems in 1957 amounted to 656 million pounds, a decline of 11 per cent from the 1956 level, the Bureau of the Census reports. Raw wool (scoured basis) used was 370 million pounds (16 per cent less than

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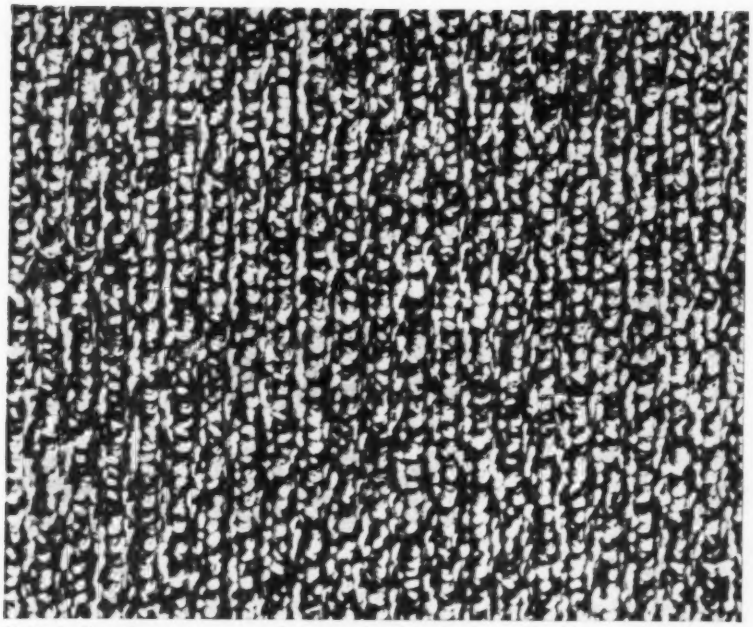


Knitted all-wool carpets are now being produced in the Saxonville, Mass., mill of Roxbury Carpet Co. Here is a close-up photo of one of the carpets in the "Woodwind" line which is manufactured in five tweed effects embodying wood tones in 12' width, with 15' width to be offered later.

in 1956), apparel class wool 241 million (19 per cent less), and carpet class wool 128 million (11 per cent less). Woolen system mills utilized 519.5 million pounds of the stock and worsted system plants 136.5 million.

Wool Jersey Shrinkage Studied. The marked increase this year in the number of shrinkage complaints involving 100 per cent wool and wool blend jersey dresses being received by the National Institute of Drycleaning for analysis was among the problems studied by NID's textile analysis advisory committee at its March meetings. Steps are being taken to determine the cause of shrinkage. Knit goods manufacturers are being contacted for a sampling of representative fabrics. The Institute will welcome any information or fabric contributions to this study.

Army to Adopt Nylon Mesh Pockets. Nylon mesh pockets on the summer knee-length trousers will eventually replace the conventional cotton drill, according to the Department of the Army. Field tests have shown that summer cotton khaki uniform knee-length trousers with nylon mesh pockets are cooler and more comfortable for warm weather wear than shorts made with pockets of cotton drill material.

Spinner - Breeder Conference. The 1958 Cotton Spinner-Breeder Conference will be held in Lubbock, Tex., October 21 and 22. The Plains Cotton Growers Association will be host to the industry-wide meeting which is spon-

sored by the Advisory Research Committee of Delta Council. This will be the 13th in the series of meetings designed to promote better understanding of mutual problems between cotton producers and cotton textile manufacturers.

Canadian Denim Mills Ask Help. Canadian mills' share of the home market for denims has dropped from 99 per cent in 1939 (when the U. S.-Canada trade agreement was negotiated) to about 81 per cent today, a spokesman for Canada's

News in Brief

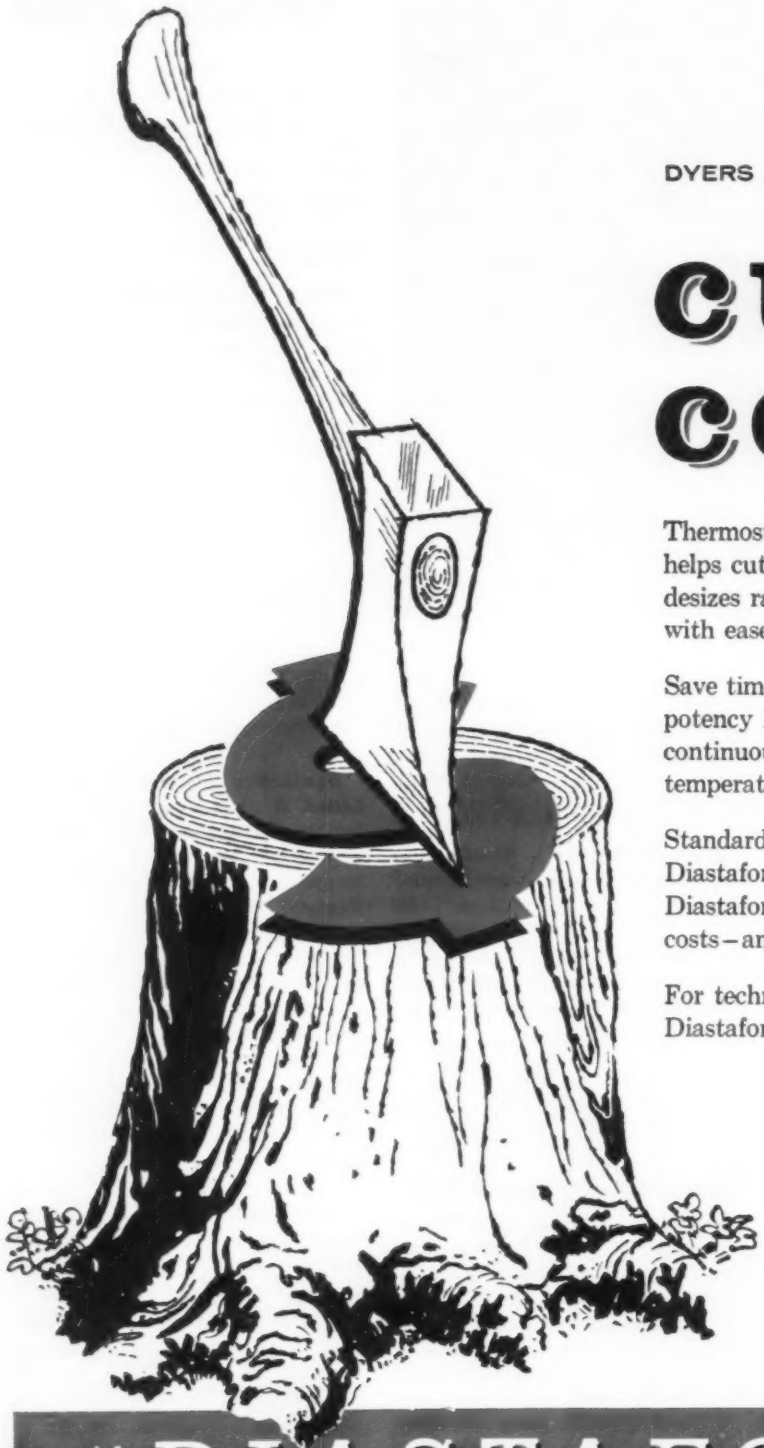
Primary Textiles Institute stated recently when requesting a higher duty rate on American-made denims. Present rate is 17½ per cent plus 3 cents a pound. Increase to 25 per cent plus 3½ cents a pound was proposed.

Navy Seeking New Officer's Overcoat Fabric. Because its officers' overcoats are too warm and too heavy for wear except aboard ship or during other extremely cold weather conditions, the Navy is looking for a fabric which has most of the good qualities of the 28-ounce broadcloth "bridge coat" without the excessive weight and bulk. A napped rather than a clear finish is preferred, but this is not an inflexible requirement. Opinions of mill men as to what fabric would best meet this need are invited. Address Department of the Navy, Bureau of Naval Personnel, Washington 25, D. C.

Synthetics Picture Brighter—Little. A much improved outlook for the synthetics fabrics segment of the industry was reported by Royal Little, board chairman of Textron, Inc., during the firm's annual meeting in May. Stockholders were informed (a) that prices of synthetics increased 0.5 to 2 cents in the preceding month; (b) forward buying is increasing; (c) prices obtained for the third quarter will permit profitable operations; and (d) full benefit of the improvement should be felt in the fourth quarter.

More Knitted Gloves in '57. According to a recent Bureau of the Census report, 979,000 dozen pairs of seamless knitted gloves and mittens were manufactured

last year, 71,000 dozen pairs more than in 1956. Over 60 per cent



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were made of wool or blends in which wool represented at least 50 per cent of the total fiber composition, analysis of the report indicated.

Against Lowering Carpet Tariffs. Roxbury Carpet Co.'s president, Charles B. Anderson, has urged that Congress reject proposals in pending legislation that would permit lowering of tariffs on imported carpets by an additional 25 per cent in the next five years. He stated that the rate has already been reduced almost two-thirds from the 1937 level, with a resultant flood of foreign carpets into the country, lost sales for American carpet manufacturers, and fewer jobs for American workers.

New Address for ACMI's New York Office. 10 East 40th St. is the location of the New York office of American Cotton Manufacturers Institute, the move from 389 Fifth Ave. having been made in June. The office is under the direction of John W. Murray.

1957 Chemical Finishing Conference Papers. The National Cotton Council has announced the availability of the proceedings of the sixth annual Chemical Finishing Conference, held in October, 1957. Copies may be obtained without charge from the Council's Technical Research Section, 1200 18th St., N. W., Washington 6, D. C.

Labor Unions No Longer Juveniles. According to the National Association of Manufacturers, labor unions no longer deserve special coddling from Congress and the courts. "They have 'come of age' and with that exalted status must come responsibility," says NAM. In a booklet, "Loopholes in the Labor Laws," the NAM pointed out that organized labor—through evasion of legal restraint and misuse of its power—now poses a major threat to the national economy. Public interest requires that unions be held to the standards of responsible adults. Copies of the booklet may be obtained from NAM headquarters, 2 E. 48th St., New York 17, N. Y., at ten cents per copy.

Aid for New England's Small Businessmen. National business leaders and government officials

Merchandising Notes

Athens Hosiery Mills, Inc., Athens, Tenn., is marketing a sock "with the fringe on top" that is expected to appeal to teen-agers. The 108-needle white anklet is reported to be stretch nylon over combed cotton foot, edged with a 2½-inch tassel trim.

Theme of this year's National Denim Week (Aug. 18-23) is: "America's Families *Live* in Denim —America's Foremost Family Fabric!" According to **The Denim Council,** an important feature of the sales aids offered free to retailers is a new publicity and merchandising extra, "How to Dress Right in Blue Jeans and All Denims," that provides them a new hook with which to increase their normally big fall-winter volume of staple denim apparel and at the same time, to promote new, coordinated merchandise.

James Lees and Sons Co., believing that "business needs positive action to stimulate sales these days," recently suggested a plan of action to help stimulate floor covering sales. Called "Dial-a-Sale," it is actually a telephone campaign to help induce customers to buy merchandise now. After a month's effort by many stores, Lees has collected evidence that where the program has been aggressively and intelligently put into operation it has been an outstanding success.

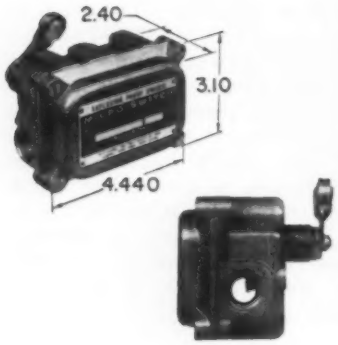
Model Carol St. John is pictured here as she delivers "The Pearl of Tycora—The Most Cultured Pantie" to resident buying offices in New York's Seventh Avenue area. The tailored panties, made of Textured Yarn Co.'s Tycora yarn and manufactured by Bayshore Mfg. Co. of Bay City, Mich., are packed in miniature cardboard oyster shells that spring open to reveal the merchandise inside. Note the oyster bucket containers used for delivering them.

Du Pont Co. has received praise from the National Retail Merchants Association's merchandising division "for the immense lift its 'hint of a tint' campaign has given to the sale of women's hosiery." Because of Du Pont's consistent and imaginative national campaign, women's hosiery has been restored to the fashion business it so vitally needs to be, the Association stated. "The touch of color has converted and continues to convert the wearing of hose from a mere item of leg-covering to a glamour-making accessory."

The Manhattan Shirt Co. is encouraging retailers to install the company's specially designed racks and display stands and create an exclusive store section devoted entirely to wash-and-wear merchandise. It is described by the company as a program for creating additional, and coping with expanding, sales volume in all types of wash-and-wear merchandise.

MICRO SWITCH Precision Switches

Compact high capacity UL listed explosion-proof switches



There is a wide variety of explosion-proof switches in the MICRO SWITCH precision switch line to help you boost productivity of equipment

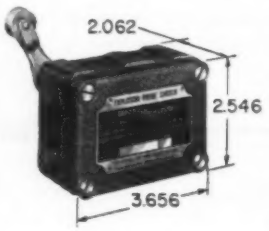
Here are a few examples of the many variations in mechanical and electrical characteristics, housings and actuators which are available in MICRO SWITCH explosion-proof switches. All feature rugged construction in sturdy housings, with a choice of mounting positions. Information on these precision switches is available from the MICRO SWITCH branch office nearest you.

Listed by Underwriters' Laboratories for use in hazardous atmospheres Class 1, Group C and D; Class 2, Groups E, F and G.

NEW

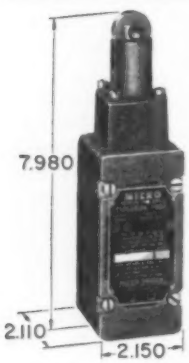
"EX1" SERIES

Series "EX1" switches have a conduit opening at both ends of the housing. This permits through wiring, which saves costs and space and improves appearance of the installation. Series "EX1" switches are available with four types of basic switches, with variations in electrical ratings, size of conduit openings and circuit arrangements. The switch illustrated has two ½-inch 14NPT conduit openings; capacity is 15 amps. 125, 250, 460 vac; ½ amp. 125 vdc; ¼ amp. 250 vdc. Contact arrangement is SPDT. Request Data Sheet No. 129.



"EX" SERIES, "AR" TYPE

Series "EX" switches have single conduit openings. They are available in a complete selection of actuators. There are 27 variations of the "AR" type alone, representing a wide choice of operating characteristics, electrical capacities and contact arrangements. This "EX" series switch is designed for cam or slide operation. Actuator is operated by clock-wise rotation, and it is adjustable through 360°. The roller is of non-sparking silicon bronze. Send for Catalog 83.



"ML-E1" SERIES

The "ML-E1" series of explosion-proof limit switches meets a wide range of requirements. For example, there are two-circuit double-throw double-break switches with a rating of 10 amps. 120, 240, 480 or 600 vac; 0.8 amp. 115 vdc; 0.4 amp. 230 vdc. The roller plunger actuator is for cam or slide operation. Sealed head can be rotated 90°. Wide choice of other actuators. Send for Catalog 83.

"ML-E1" SERIES

This series "ML-E1" switch has a roller lever actuator which can be positively locked at intervals of approximately 0.4° (870 positions). The actuator can also be adjusted to actuate the switch in the clockwise direction only, the counter-clockwise direction only, or in both directions. The head assembly can be faced in any of four directions and the roller arm may be reversed on the head. Send for Catalog 83.

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Look for the name of MICRO SWITCH *Authorized Distributors in the Yellow Pages*

Honeywell
MICRO SWITCH PRECISION SWITCHES

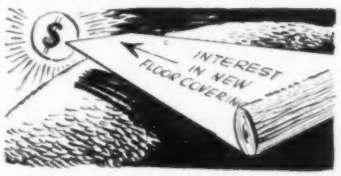
will participate in the New England regional conference on technical and distribution research and development, Oct. 15-16, at Boston's Hotel Somerset. The meeting is sponsored by the New England Council in cooperation with the Small Business Administration and the U. S. Department of Commerce. Discussions will center on methods and activities to attain increased profits, improved operations, and efficiency for small business.

Man-Made Fiber Broad Woven Goods Output. Production of broad woven goods (over 12 inches wide) of man-made fibers and silk is reported to have been 574 million linear yards during the first quarter of this year, a quantity 2 per cent below the fourth quarter 1957 level but 1 per cent above the previous quarter and 5 per cent more than the output during the comparable period of the preceding year.

NAWM Hits Tariff Proposals. The National Association of Wool Manufacturers states that the U. S. Tariff Commission proposals to reorganize textile fibers and product tariff schedules will continue the "illogical lack of comparability between data on imports and domestic production." A Commission proposal would retain the fiber of chief value in a textile product as the key to classification of textiles for duty purposes. Government statistics on domestic production, however, are based on the fiber of chief weight, NAWM pointed out. The problems of determining fiber of chief value in textiles has magnified many times with the increase in blending of fibers of all kinds and the growth in variety of man-made fibers and yarns available over a wide price range, the Association said. According to the Association, retention of the fiber value criteria will permit foreign producers to shop for bargain tariff rates. A proviso also was recommended on duties for ornamental fabrics to prevent the use of ornamentation as a means of qualifying for lower duties.

Supima Growers Ask Lowered Price Supports. Supima cotton growers have promised an all-out drive to boost sales of American extra long staple fiber with the aid of lowered price supports. Enactment of pending legislation to put supports on a flexible basis could lead to an early price cut of 5 to 13 cents a pound, making Supima more competitive with Egyptian growths. Present support price of Supima is about 62 cents a pound on the farm. "We asked Congress to lower the support price because we want to sell our cotton to the world's textile industry, not let it pile up in government loan stocks," said J. Clyde Wilson, president of the Supima Association.

Carpet Prospects Brighter. The outlook for carpet production and sales during the second half of the year is much more optimistic, according to a spokesman for Aldon Rug Mills, Lenni Mills, Pa. A survey made by Aldon's market research division shows the consumer is "definitely interested in new floor coverings" in homes eight to ten years old. This fact, together with low inventories now being held by dealers, the sudden upsurge in the number of new homes under construction, and greater interest in promotion by carpet manufacturers, accounts for the brighter outlook.



Looms in U. S. Wool Mills. On December 31, 1957, there were 15,517 looms in place in woolen and worsted mills of the United States, according to the Bureau of the Census. Activity in the first quarter of this year was reported to be 13.6 million loom hours, practically the same as for the last quarter of 1957, and 2.6 million loom hours less than the comparable period of last year.

Drycleanable Fabric Requirements. The National Institute of Drycleaning has ruled that a product cannot be classed as drycleanable unless it has good colorfastness, finish retention, and is dimensionally stable in both Stoddard solvent and synthetic solvent (perchlorethylene) drycleaning systems, the two principal solvent systems used in the U. S. and Canada. Only exception to this rule is when an article is labelled with a sewn-in or other permanent type label bearing specific instructions for drycleaning; it is then the drycleaner's responsibility to follow the instructions.

News in Brief

ASTM Cotton Fiber Standards Approved by ASA. Eight standards of the American Society for Testing Materials covering cotton fibers have been approved as American Standards, it was announced by the American Standards Association. They are: methods of sampling for testing; test for cross-sectional characteristics; test for strength by flat bundle method; test for number of neps; test for length of fibers by Fibrograph; test for fineness of fibers by Micronaire; Arealometer method for determining specific area and immaturity ratio of cotton fibers; and the polarized light method of testing for maturity. Copies are available from ASA at 30 cents each.

First "Little Miss Cotton." Nine-year-old Cheryl Ann Summers became the first national Little Miss Cotton at contest finals held during the recent National Cotton Council-sponsored Cotton Carnival

in Memphis. She is the daughter of Mrs. Sybil O. Summers of East Point, Ga. Cheryl Ann won the title over 16 other contestants. Her job is to help the cotton industry maintain and build the children's wear market—one of cotton's biggest.

Man-Made Fiber Fabrics Mills Loom Data. The 94,382 looms in place in man-made fiber and silk weaving mills on December 31,

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CARBON BISULFIDE exceeds 99.99% purity. Stauffer was the first—is still the largest—producer of this essential chemical. Shipped in tank cars of 8000 and 10,000 gallons from Bentonville and Roanoke, Va., Lowland, Tenn., LeMoyne, Ala., Chester, Pa., and Perry, O.; in 5, 10 and 55-gallon drums from LeMoyne and Richmond, Cal.

SODIUM HYDROSULFIDE in aqueous solution of high purity and highest practical concentration is shipped in tank cars of 8000 and 10,000 gallons from Chester, Pa., Roanoke, Va., Lowland, Tenn., and Richmond, Cal.; in 55-gallon drums from Chester and Richmond and in tank trucks from Richmond.

CAUSTIC SODA of 50% and 73% liquid Rayon Grade is shipped in tank cars of 8000 and 10,000 gallons from Niagara Falls, N. Y.

SULFURIC ACID is available in commercial grades of 77.67% to 122.5% H_2SO_4; as Oleum of 15% free SO_3 to 100% liquid SO_3, and as regenerated, water-white 98% H_2SO_4. Shipments are made in barges, tank cars, tank trucks, drums and carboys from many points in the South, Midwest and West.

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1957, operated 122.4 million loom hours during the first quarter of 1958, the Bureau of the Census reports. 93,641 of the looms were classified cotton, silk, and rayon looms, and 741 as woolen and worsted type looms. Of the former, 19,089 were said to be single shuttle cam looms, 45,200 single shuttle dobby looms, 23,551 cam or dobby operated box looms, and 5,801 single shuttle or box pile and Jacquard looms.

Fixer Training Schedules. Sample apprenticeship schedules covering textile mill maintenance personnel (i.e., card room mechanic, comber fixer, drawing frame fixer, spinning fixer, loom fixer, etc.) are contained in a new publication. They are intended for use as guides for the development of skilled operatives. Titled "Sample Apprenticeship Schedules" (Industry Bulletin No. 2), booklet may be obtained free from the Bureau of Apprenticeship and Training, U. S. Dept. of Labor, Washington, D. C.

Silk Warp Fabrics Continue to "Split." Very little progress has been made in identifying the cause of silk fiber deterioration in silk warp fabrics which results in tears or "splits" in the filling direction, according to an announcement by National Institute of Drycleaning. NID's textile analysis advisory committee recommended that because this classification accounted for 906 complaints in 1957 and represented the second highest in types of fabric failures recorded, that efforts to find a solution should be redoubled.

Wool Fabrics Made in First Quarter. Woolen and worsted fabric production during the first quarter of this year was 61.2 million finished linear yards, The Bureau of the Census reports. This was 1 per cent above fourth quarter 1957 output and about 17 per cent below the comparable period of the previous year.

To Have More Man-Made Fiber Fabric Statistics. With the announcement at the first meeting of the Man-Made Fibers and Silk Division of the American Cotton Manufacturers Institute that the statistical services on man-made fiber fabrics, which were formerly provided by the National Federation of Textiles, will be expanded, ACMI president Halbert M. Jones stressed the usefulness of statistics to expand markets, prevent loss of markets, and to make products to meet market needs.

Canadians Ask Import Relief. The Canadian Primary Textiles Institute has told the Tariff Board that there are three methods by which Canada can deal with imports from low-wage countries: Minimum tariff rates, which would have to be set too high for countries such as Britain and the U. S.; fixed valuation for duty purposes; or quotas established by the

(Continued on page 67)

News in Brief

WHAT'S YOUR NEXT, *BEST* MOVE?

To build? To modernize? To make minor improvements in methods and facilities *now* that are the first, *best* steps in a long range program to keep you constantly ahead of competition?

The *right* move—at the *right* time—follows a carefully planned expansion program . . . developed with the help of a qualified independent firm of engineers:

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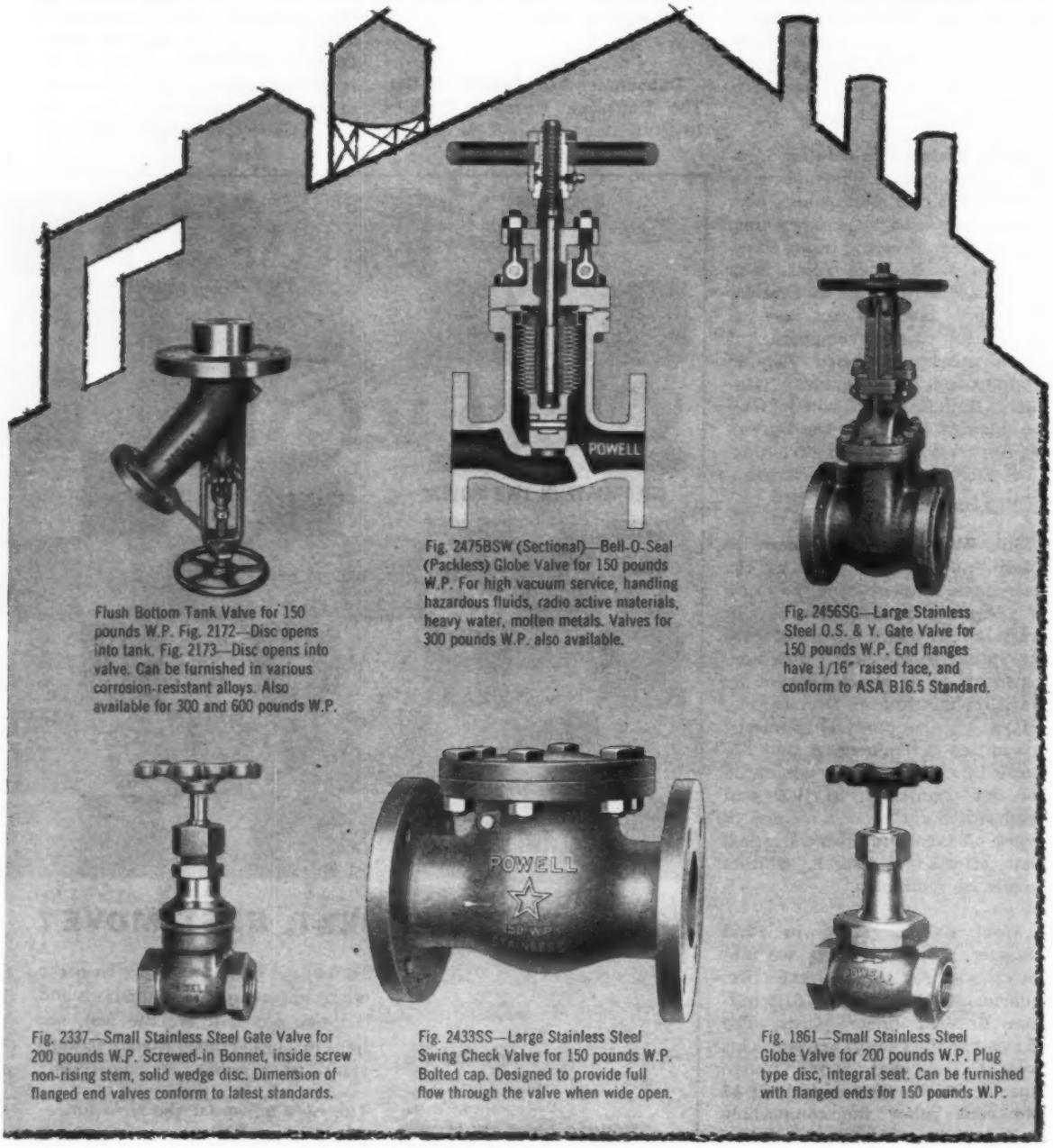

Flush Bottom Tank Valve for 150 pounds W.P. Fig. 2172—Disc opens into tank. Fig. 2173—Disc opens into valve. Can be furnished in various corrosion-resistant alloys. Also available for 300 and 600 pounds W.P.

Fig. 2475BSW (Sectional)—Bell-O-Seal (Packless) Globe Valve for 150 pounds W.P. For high vacuum service, handling hazardous fluids, radio active materials, heavy water, molten metals. Valves for 300 pounds W.P. also available.

Fig. 2456SG—Large Stainless Steel O.S. & Y. Gate Valve for 150 pounds W.P. End flanges have 1/16" raised face, and conform to ASA B16.5 Standard.

Fig. 2337—Small Stainless Steel Gate Valve for 200 pounds W.P. Screwed-in Bonnet, inside screw non-rising stem, solid wedge disc. Dimension of flanged end valves conform to latest standards.

Fig. 2433SS—Large Stainless Steel Swing Check Valve for 150 pounds W.P. Bolted cap. Designed to provide full flow through the valve when wide open.

Fig. 1861—Small Stainless Steel Globe Valve for 200 pounds W.P. Plug type disc, integral seat. Can be furnished with flanged ends for 150 pounds W.P.

For every flow control problem Powell offers more kinds or types, available in the largest variety of metals and alloys to handle every flow control requirement. Powell distributors are located in all principal cities and maintain inventories to fill almost any need. For special engineering problems, write direct to:

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AN EXECUTIVE Views

THE NEWS IN TEXTILES

Prepared by a man who is closely identified with the textile industry.

The raw cotton industry—synthetics' best salesman?

I HAVE been talking to a lot of people out here in the cotton country about gin damaged cotton, and regardless of what some people in the raw cotton business may think on the subject, every mill man I have talked with heartily curses the lint cleaners and their disastrous effect on cotton.

This morning I was with a man in Dallas who has been a very good cotton buyer for about 30 years, and who was showing me visually in a lot of cotton samples some of the dreadful effects of lint cleaners. He had dozens of samples of otherwise satisfactory cotton which had to be rejected on account of shredded bark as the result of putting the stock through these licker-in cylinders. This gentleman expressed the emphatic opinion that the present government policies are ruining the cotton business.

Another man pointed out that two years ago relatively few of the gins in his area were equipped with lint cleaners, but that last year practically all of them installed these licker-in type arrangements, with the result that he can't use their cotton and is having to hunt for cotton somewhere else.

I think this is a subject that needs to be vigorously pursued at every possible opportunity, because too many informed persons agree on the permanent damage to the whole American cotton industry resulting from ginning practices which do not have to be followed, but are purely a matter of choice on the part of the Department of Agriculture, to try to give the farmers a little bit more money by perpetrating a fraud upon the spinners.

One man told me that nothing could possibly boost the synthetic fiber business any more effectively than this continued maltreatment of cotton at the gins, and that he was expecting to begin mixing synthetics with his cotton very shortly, and to use more and more synthetics and less and less cotton.

This shift to synthetics has very little effect on the textile industry, but it has a disastrous effect on people who raise cotton for a living. A poor quality cotton which is not welcome abroad leads to things like the soil bank, and the soil bank has simply ruined a lot of small southern towns, which have depended for their existence on the sale of farming supplies.

The farmers get the money, but they don't spend it for fertilizer and farm machinery and other supplies. They generally wind up in some nearby city trading for an automobile or something else that doesn't help the economy of the little town.

There may be many good arguments in favor of doing this, but some day the government may decide to drop the whole thing and we will have a thoroughly disjointed farm economy trying to pick itself up off the floor and get started again.

By no means do all of the gin machinery manufacturers view the trend to lint cleaners as an unmixed blessing. One told me that

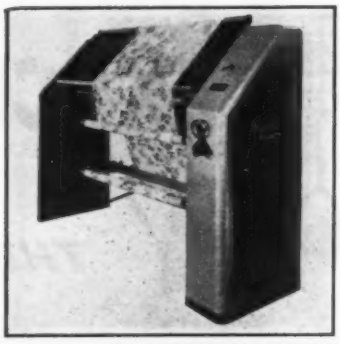
The Welfare State — Texas Division

■ This year's figures aren't in, but it is interesting to examine the costs of growing cotton in Texas last year. In western Texas it cost the producer 23 cents for each pound of cotton he raised. But in eastern Texas costs were much higher—31 cents a pound.

In theory, the workings of a free enterprise economy would have caused the cotton farmer in eastern Texas to switch to raising yams, or go into the oil business. But no—eastern Texas still produces a quarter of the state's cotton crop.

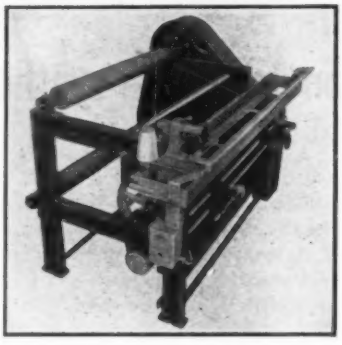
Why? With the government propping up the price of cotton, the small, high-cost farmer can continue on his merry, uneconomic way. And if his costs rise above the support price, there's always the soil bank.

And so we have export subsidies; two-price systems; an unrealistic grading system, which permits the ginner to over-machine and over-dry cotton without penalty—and a steadily increasing consumption of synthetic fibers.



BROADWAY INSPECTOR

To rewind, inspect and measure piece goods—8 to 1 ratio—full reverse—safety side panel—C & M quality at low initial cost.



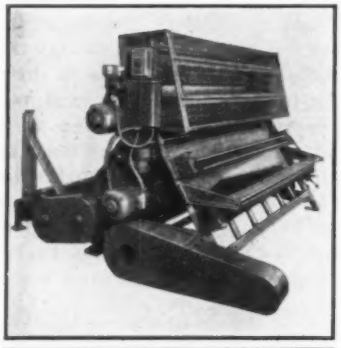
DUPLEX SEWING & WINDING MACHINE

Sews loom rolls together into large roll for faster shearing. Large roll fed to shear as second large roll is being made simultaneously.

It's how you finish that counts. Cloth room machines which have become obsolete have lost their profit life to your mill. Think over your needs now. Then get the facts about new machines from our engineers. They can help you. Ask around. You'll find out why most textile men buy "C & M".

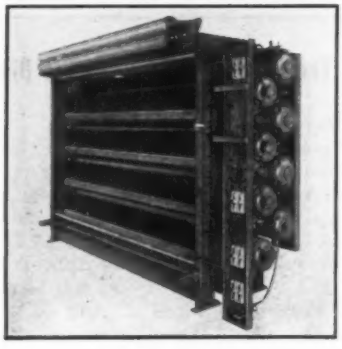
HERMAS AV SHEAR

4-knife vertical space-saver for fast, clean-cut shearing—individual motor drives—automatic seam protector—micro cloth rest adjustment—special attachments available to fit your shearing needs.



HERMAS BRUSHER

Newest model BRVM vertical brusher—8 rolls all with individual motor drives and suction hoods—calibrated adjustment for brushing pressures—tension unit—electric brakes—variable speed cloth drive.



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he has been forced against his wishes to manufacture these gin combers as the alternative to going out of business, and that in another year or so there will hardly be a gin in North America not equipped with these infernal machines.

I understand that the Mexican ginners, who haven't the slightest earthly reason for installing these things, are putting them in anyway, because they want their gin outfits to be like those in the United States, and they are willing to ruin their cotton to do it.

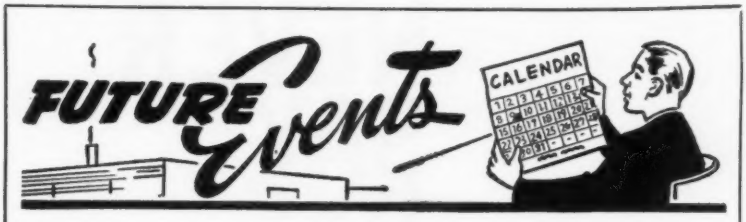
News in Brief

(Continued from page 63)

Canadian government. "Japanese voluntary quotas are no restraint," said an Institute representative.

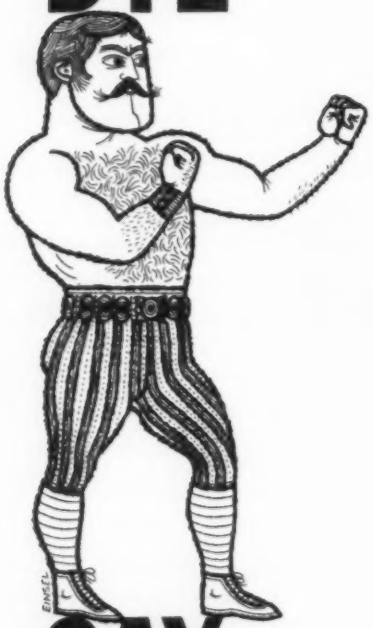
Drycleaner-Applied Cotton Wash-Wear Finish Under Test. Crease-holding, wrinkle-resisting resin finishes which can be applied to cotton garments with standard drycleaning equipment have been developed and are now being tested by scientists of the U. S. Department of Agriculture and the drycleaning industry. The finish will not last the life of the garment, but on the basis of cost studies USDA scientists believe the treatment will be inexpensive enough to justify renewal. Because of the need for closely controlled conditions under which the fabric is treated, the process is not suitable for application by the housewife, the announcement indicated.

Tow Converted to Top Last Year. The amount of tow that was converted to top in 1957 was 27 million pounds, according to a recent Bureau of the Census fiber consumption summary for woolen and worsted mills. This was a half million pounds less than the quantity of tow utilized in 1956.



Date	Event	Location
Aug. 18-22	Massachusetts Institute of Technology course on Techniques of Textile Research	M.I.T. Cambridge, Mass.
25-29	M.I.T. Summer Course on the Mechanics of Textile Structures	M.I.T. Cambridge, Mass.
Sept. 9-10	The Fiber Society	Montreal, Que.
11-12	Combed Yarn Spinners Association annual meet	The Cloister Sea Island, Ga.
11-12	6th Canadian Textile Seminar	Queens University Kingston, Ontario, Can.
12	Delaware Valley Section AATCC	Wilmington, Del.
12	Northern New England Section AATCC outing	Wachusett Country Club West Boylston, Mass.
13	South Central Section AATCC	Hotel Patten Chattanooga, Tenn.
13	Southeastern Section AATCC	Ida Cason Gardens Chipley, Ga.
18-19	Chattanooga Yarn Association annual outing	Read House Chattanooga, Tenn.
19-20	Piedmont Section AATCC	Hotel Charlotte Charlotte, N. C.
25-26	Northern Textile Association	Wentworth-by-the-Sea Portsmouth, N. H.
25-26	Textile Quality Control Association	Grove Park Inn Asheville, N. C.
26	Niagara Frontier Section AATCC	Niagara Falls, Ont., Can.
26	Rhode Island Section AATCC	Warwick Country Club Warwick, R. I.
26	Western New England Section AATCC	Hartford, Conn.
Oct. 1-2	Chemical Finishing Conference	Washington, D. C.
6-10	Southern Textile Exposition	Greenville, S. C.
9-10	North Carolina Textile Manufacturers Association annual meeting	Carolina Hotel Pinehurst, N. C.
10	Southern Textile Overseers Association	Greenville, S. C.
14-16	National Industrial Packaging, Handling, and Shipping Show	The Coliseum Chicago, Ill.
14-17	A.S.T.M. Committee D-13 fall meeting	Sheraton-McAlpin Hotel New York City
15-25	International Textile Machinery Exhibition	Belle Vue Manchester, England
21-22	Cotton Spinner-Breeder Conference	Lubbock, Tex.
23-24	Southern Textile Methods & Standards Association	Clemson House Clemson, S. C.
25	Alabama Textile Operating Executives carding and spinning discussion, 9:30 A.M.	Thach Auditorium Auburn, Ala.
28-29	Institute of Textile Technology technical advisory committee and board of trustees	I.T.T. Charlottesville, Va.
28-31	Carded Yarn Association annual meeting	The Homestead Hot Springs, Va.
Oct. 30-Nov. 1	AATCC national convention	Hotel Conrad Hilton Chicago, Ill.
Nov. 7-8	Textile Seminar sponsored by University of Georgia division of clothing and textiles in extension, teaching, and research	Georgia Center for Continuing Education Athens, Ga.
8	Textile Operating Executives of Georgia slashing and weaving discussion; 9:00 A.M.	Georgia Tech Atlanta, Ga.
17-19	Narrow Fabrics Institute annual meeting	Hotel Roosevelt New York City

NEVER SAY DYE



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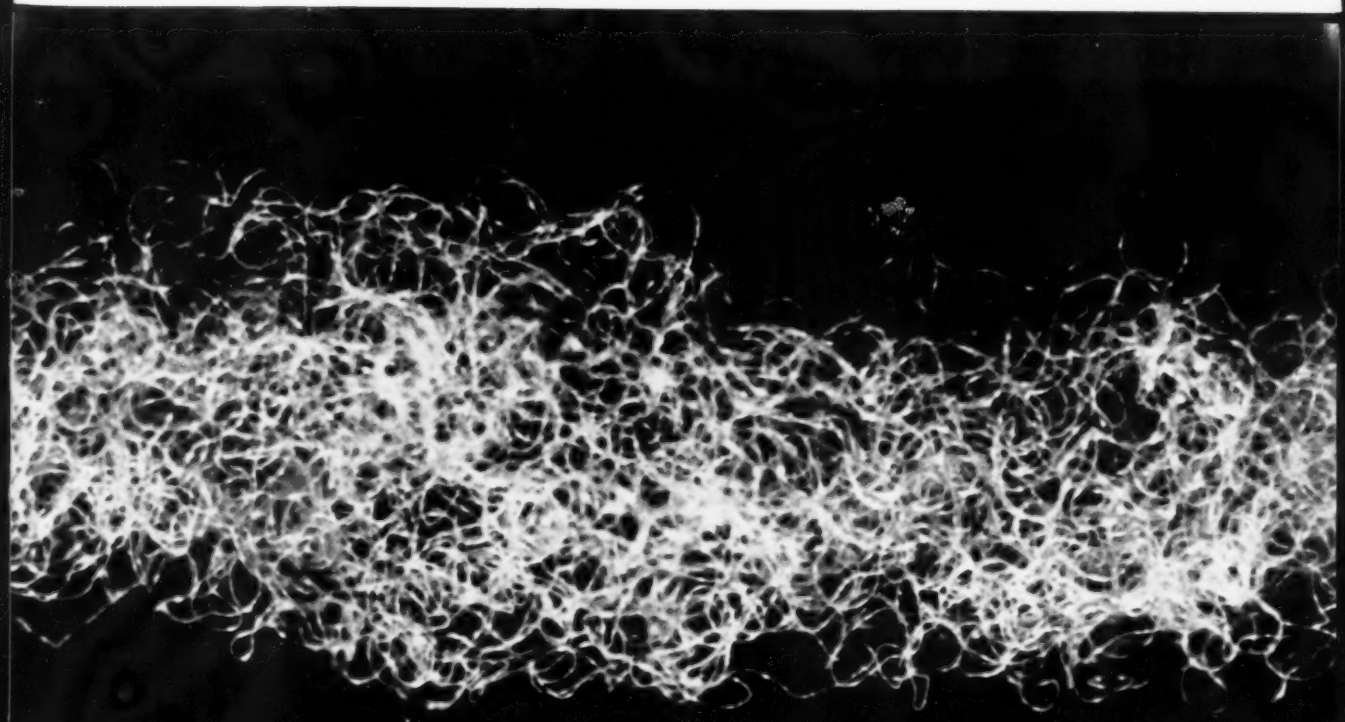

Textile Industries *presents*

MAN-MADE FIBERS

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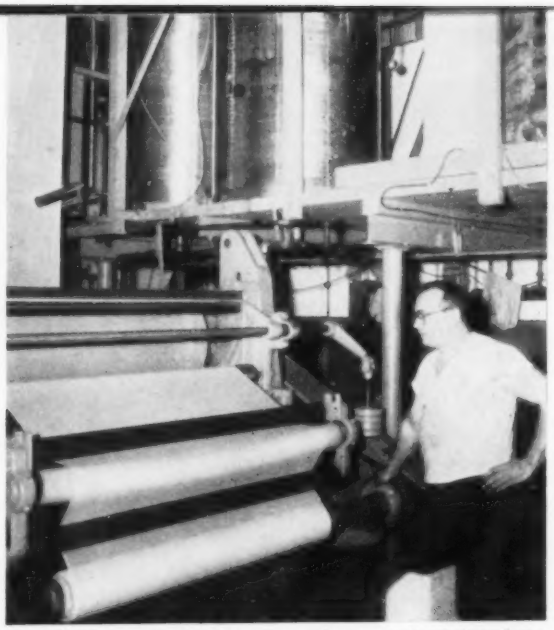
Edited by J. B. Goldberg, consultant, and the staff of "Textile Industries"

Dyeing Blended Fabrics

with special emphasis on Dacron/cotton

by John A. Komninos
Waldrich Co.

Exclusive



The 65/35 Dacron/cotton fabric is padded in a solvent formulation to remove the wax used to size the Dacron fiber part of the blend.

DACRON, Arnel, Orlon, and their complementary cotton and viscose rayon portions are the major fibers involved in the newer synthetic fiber blends with which this article is concerned. In a sense, the market acceptance of the blended fabric and its continuing growth has caused a conflict within many companies—for that matter, throughout the wet-processing industry.

The synthetic portion of the fabric, because of its relative youth, the variety of processes involved for a color line, and general developmental nature, would suggest batch-wise operations. The cotton portion of these blends, on the other hand, calls for continuous processing methods which have become almost universal among cotton finishing plants.

Rather than meet the problem at a juncture, the synthetic and cotton finishing plants are employing both batch and continuous methods to the best of their ability, utilizing their on-site equipment. By so doing, the synthetic and cotton wet processors have entered a common arena of competition.

It would appear that the reluctant combatants in this transition will eventually emerge welded, so to speak, into a new species: the synthetic blend finisher.

The most important factors at interplay in this conflict are fiber content, cost, end-use color lines, end-use fastness and performance, and yardage flow. These specifics immediately narrow the limits of the arena. Blends containing high concentrations of cotton with relatively long yardage flow will seek out the cotton wet-processing system.

Where the blend favors the synthetic fiber, converse conditions must and do exist. The synthetic dyer then processes such blended fabrics along lines prescribed for the all-synthetic fabric.

This leaves a middle area for fabric blends where fiber concentration is roughly in the proportion of 65/35, either way. Into this area fall synthetic/cotton blends, and nearly all blends that exceed viscose rayon contents of 20% on the weight of the fabric. The higher the viscose rayon content in relation to cotton content, the more suitable it is for the synthetic dyer to process—for he has had long experience with low caustic soda concentrations in processing viscose rayon, which stands him in good stead.

The Waldrich Co. for many years has been a processor of viscose rayon, acetate, nylon, and their many mixtures and blends.

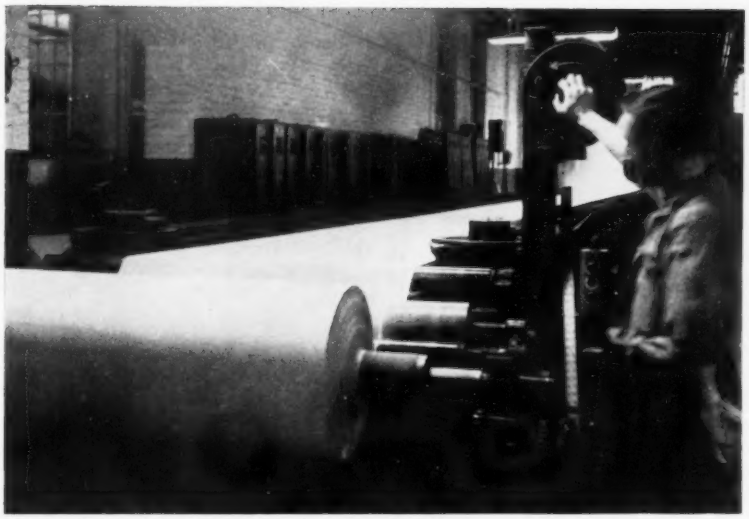
Since it is a batch-unit plant, the processes for dyeing the newer synthetic blends are very diverse. *Table 1* (page 72) shows the mechanical methods being used.

Several important factors must be weighed in deciding upon the dyeing machinery to be used. These are fabric structure, shrinkage as it relates to "hand," allowable yardage loss for plant put-through and colorant application economics.

Once the dyeing machinery has been selected, the next most important single consideration is dyeing temperature attainable on the equipment. The temperature attainable will dictate the selected group of colors from a family of dyestuffs, and point to the type of carrier required. Naturally, the higher temperature dyeings will require the least volatile carriers. For dyeings at super-atmospheric conditions, carriers are not required.

It is almost axiomatic that when the blends are really intimate in both warp and filling directions, they may be dyed by any of the mechanical methods listed in the table. When the synthetic fiber makes up the warp or filling, without any blended (cellulosic/synthetic) yarn in the opposite direction, the machine chosen is usually of the open-width form. From a standpoint of creasing and general unfinished appearance of a dyed fabric, the open-width form of machine is preferred.

Despite maximum care in heat-setting, framing, and finishing, creases are usually the result of ropeform handling. If the synthetic is blended in one direction only (warp-wise or filling-wise) rope or open-width equipment may



Fabrics which will be processed on the jig are first framed and batched evenly. Color selection is more critical for jig than for rope form; vats are best dyed open-width.

be used.

Fabrics of Dacron/cotton in a 65/35 proportion, in which the fibers have been intimately blended, are by far the most popular in today's market. They are found in a variety of weaves, such as batistes, poplins, voiles, broacloths, and suitings. In the heavier outerwear field, 50/50 Dacron/cotton or Dacron/rayon, in weaves such as twills and sharkskins are popular.

Practical business considerations often cause the introduction of fabric blends that are lacking in end-use performance. Such ill-considered practices also multiply the finisher's headaches in processing these "off-beat" blends.

The path of least resistance in fabric designing is to replace the filling yarn of an established fabric with a blended Dacron/Cotton yarn. Sometimes promotional chicanery appears to move others to reverse the proportions of Dacron to cotton, from 65/35 to 35/65, multiplying the dyer's headaches in engineering such a fabric through a plant.

In all probability, the general color fastness is sacrificed to expedience. In the case of pleatability, or crease retention, and wash-wear properties, the observant consumer always recognizes the substandard article. And the first one called upon to explain failure of a fabric is the dyer-finisher—but he is the one who finds it most difficult to prove where the fundamental failing exists.

It has been indicated that operations for blended fabrics, in which the proportions of fibers are roughly in the 65/35 range, are dependent on the type of plant—whether it is a processor of cottons or synthetics. In *Table 2* (page 73) are listed the sequences of operations for fabrics containing 65% Dacron/35% cotton.

The sequence of operations for blends of Arnel/cotton and Orlon/cotton as listed below can be carried out by either synthetic or cotton finisher, but the processing of these fabric blends is usually an established routine in a synthetic finishing plant.

50% Arnel, 50 % Cotton
Desize
Steam
Scour
Bleach and/or
Dye
Heat set
Finish

50% Orlon, 50% Cotton
Desize
Steam
Scour
Bleach and/or
Dye
Finish

GENERAL PROCESSING TECHNIQUES

Preparation. Intimate blends of Dacron/cotton, in the main, contain self-emulsifying waxes on the Dacron fiber, and starch sizing on the cotton fiber. Fabrics containing warp yarns of 100% Dacron are usually over-waxed, that is, an additional layer of wax is applied to the yarn containing the emulsifiable wax. Therefore, the following difference in processing is observed:

Intimately Blended 65% Dacron, 35% Cotton:
Enzyme pad
Steam
Caustic scour
Solvent (Varsol) emulsion scour

100 % Filament Dacron Warp Fabric:
100% solvent pad (Lag of 2-6 hours)
Caustic scour
Detergent scour
Desize (optional)

In either of the above cases, cotton-wax is at times the cause of subsequent penetration problems. Addition of dichlorethyl ether in the solvent emulsion or the 100% solvent pad is very effective in its removal.

Though the yarn tenacity may be markedly reduced by extended exposure of Dacron to hot caustic soda solutions (1 to 2% by volume), it may be used as a preparatory step for two reasons: The very regular erosion of the cross section of the fiber results in "hand" improvement which may be due to relaxation of fabric strain. Secondly, the cotton portion, if not previously mercerized, will become more receptive to direct dyestuffs.

The traditional cotton mercerizing technique, which calls for a high concentration of caustic soda at a low temperature, may be used on Dacron/cotton for the known benefits to the cotton fiber without much, if any, effect on the Dacron.

Should a fabric contain any viscose rayon, however, this could be dangerous, for in rinsing, the fabric passes through a phase of dilute caustic soda concentrations where solubility of the viscose rayon is at a maximum. Thus a plant not equipped with adequate counter-current, over-flowing hot water rinsing, temperature and water rate control may damage such a fabric.

Bleaching. The type of cotton in the fabric, its cleanliness, and the population of motes, decides the bleaching procedure.

1. For intimate blends with

TABLE 1. Dyeing Methods Used at Waldrich Co. on Blended Fabrics

Rope Form	Loading Method
Open dye-box	
a. Shallow	Separate piece strands individually wound
b. Deep	One endless helical winding of many pieces
Dyeing temperature range 160 F to 185 F	
Enclosed dye-box	
a. Without steam injection above liquor	Same options as above
b. With steam injection above liquor	Same options as above
Temperature range 180 F to 210 F with or without carriers	
Open-Width Forms	**Dyeing Temperature Range**
Open jig	160 F - 180 F
Enclosed jig	180 F - 200 F
Barotor pressure dyeing	210 F - 250 F
Resinous bound pigment padding	Gradually dried and then baked at a temperature dependent on resin binder
Vat pigment padding and jig development	
Reactive-dyestuff padding	Instantaneous steam development followed by dry-heating
Disperse color padding	Jig dye to completion; Thermosol development and jig-dye to completion
Continuous padding with soluble vat class dyestuffs	

combed cotton, generally clean and without motes, the following procedure and formulation are used:

4 gr/l sodium chlorite
1 gr/l nitric acid (61%)
185-195 F for a minimum of 1 hour

2. For similar blends with regular cotton, with few motes, the following formulation and precedure are used:

5 gr/l hydrogen peroxide (35%)
5 gr/l sodium silicate
180 F for a minimum of 1 hour

3. For mixtures of Dacron/cotton or Arnel/ cotton where motes are dense, the following formulation and procedure are used:

1-2 gr/l sodium hypochlorite
Hydrofluoric acid to pH 4-5
At 160 F for ½ hour
Rinse, and then treat in following for a minimum of 1 hour at 190 F:
5 gr/l hydrogen peroxide
3 gr/l sodium silicate.

Precedure 1 improves the whiteness of both Dacron and cotton. Procedure 2 bleaches out motes and cotton only. Procedure 3 bleaches out motes and improves whiteness of Dacron and cotton fibers.

4. Orlon/cotton: Usually, oxalic acid-treated when cotton is dyed only. It is not bleached when Orlon is dyed only.

Optical Bleaching. Two possibilities exist: The cotton can be "dyed" white, or both the Dacron and cotton can be "dyed" white.

A. Cotton only:

Depends on choice of bleaching system and shade of white desired. The "white dye" may be incorporated in the bleach bath. It is chosen for its compatibility with the bleaching system. For most economical yield, it is introduced at the lowest temperature and is usually fully exhausted before chemical bleaching begins.

B. Dacron and cotton:

Optical bleaching of Dacron requires high temperatures for exhaustion, thus when cotton is present a two-phase operation is called for. After the Dacron is dyed at near boiling temperatures in a shallow bath, cooling water is run in to fill dye-box. Then, a fast exhausting cellulosic "white dye," requiring minimum salt, is added to the full bath. This operation may follow or be concurrent with the chemical bleach.

C. Arnel or Orlon blends:

The cotton here is allowed to carry the full dyed white effect.

DYEING

Dyeing Cotton and Reserving Dacron (Arnel or Orlon). With one exception, fabrics blended with these fibers may be dealt with as if they were cotton fabrics. The naphthol prepare operation, or dyeing with Rapid Fast colors, cannot be employed where specifications call for a white Dacron, since they have an affinity for the Dacron fiber. In fact, they have been tried out as carriers and result in surface staining.

All other classes of dyestuffs, however, are applicable. Directs, developed, vats, soluble vats, sulfurs, and the recent reactive types, all reserve Dacron.

The direct and developed classes are best applied in the rope form; though they may also be applied on the jig. Poor shade reproducibility, side to side shading, and shade tailing may result if a successful rope-form box formula is attempted on a jig. This indicates that color selection for jig work is much more critical, narrowing the range of dyestuffs for this operation.

Vats and soluble vats are best handled in open-width form, in pad-jig or range operations.

The fiber - reactive dyestuffs have been applied only in open-width form, but some new techniques for rope-form dyeing are now being developed by the supplying companies.

Sulfur dyestuffs are applied on the jig. Best results are obtained at 120 F dyeing temperature with several warm washes before oxidation with hydrogen peroxide. There is a varying degree of synthetic fiber staining in the following order, nylon (least), Dacron, Arnel.

Dyeing Dacron and Reserving Cotton. The only dyestuffs applicable to Dacron are of the dispersed insoluble type. Among these are selected acetate types, usually the high-temperature dyeing ones, and the specifically developed disperse colors for Dacron.

The solvent-type carrier system of dyeing often gives the cleanest nonstained, cotton effect. However, attention to scouring after dyeing with the solid-type carrier can produce equally clean cotton whites.

Union and Cross-Dyeing Dacron/Cotton. This type of dyeing may be carried out by either a one- or two-bath method. Vats, soluble vats, sulfurs, and reactive dyestuffs all require a two-bath method of application. It is advantageous to dye the Dacron first and proceed with the cotton dyeing in the second bath. The cotton dye bath, or its

after-treatment, then serves as a very effective Dacron surface cleaner.

In direct or developed dyeing of cotton, both fibers are dyed in one bath. The hours saved with the one-bath method, and the economy of direct or developed colors, make this the most preferred method in today's market. Sulfur blacks and navies are probably the only dyes applied in the two-bath method which can equal or perhaps slightly improve on material cost of the one-bath method.

Novel Dyeing Methods. Pastels and light shade unions are without question most economically produced via resin-bonded pigment padding. A prerequisite is large yardage flow and a stable range of specific colors.

Thermosol, or heat dyeing, of Dacron/cotton fibers in one passage can be done by use of Rapid Fast dyestuffs. This consists of padding the color formulation, steaming to develop the color on the cotton, and heat-treating to fix the naphthol in the Dacron.

Good unions may be obtained by this method, but the crock-fastness leaves something to be desired.

General Comments on Dyeing. The fastest direct-dyed blacks and navies are produced on the Barotor, where dyeing takes place with direct disperse colors at 250 F. Dark browns and greens, whose component yellows and oranges are high-yielding colors at 200 F, do not require the higher temperature, and may be dyed with carriers on conventional equipment.

Blacks and navies, produced via carrier dyeing on Dacron, may be almost as good in general fastness properties when the cotton portion is subsequently vat-dyed. Apparently, the reducing chemicals in the vat formulation serve to remove the surface-deposited dyes from the Dacron. This may also be said for the developed blacks on Dacron with one qualification; namely, that spun Dacron seems to give better results than filament Dacron in light fastness and crock-fastness.

With regard to dyeing the cellulosic fibers in shades of black and navy, economics and color application technique serve to cause these differences: If the fabric is a jig-process fabric, sulfur blacks and navies are used. If the fabric is to be handled in the rope-form, formaldehyde after-treated blacks are called for.

TABLE 2. Sequence for Finishing 65/35 Dacron/Cotton Blends

Cotton Finishing Plant	Synthetic Finishing Plant	
	Regular Dyeing	High Temp. Dyeing
Desize	Solvent scour	Heat set
Steam	Caustic scour	Scour (solvent)
Scour	Bleach and/or	Caustic scour
Mercerize	Dye (jig-box-range)	Dye (Barotor)
Bleach (continuous) and/or	Heat set	Singe
Dye (continuous or jig)	Singe	Finish (resin application)
Heat set	Finish:	
Singe	Resin application	
Finish:	Compressive shrinkage	
Resin application and curing	Resin wash (white goods)	
Compressive shrinkage		
Resin wash (white goods)		

Final dyed appearance of these fabrics is an important commercial factor. For a given fabric, the 65/35 Dacron/cotton blend, for example, in black or navy, the various methods described all yield good blacks. However, regardless of how close the match from one system to another may be, a comparison of several yards of one black with several yards of another black may reveal a marked difference to a critical observer.

Black dyeings on Dacron via the azoic-developed method, where the cotton is secondly dyed with Sulfur black at 120 F, have a denser black appearance than Dacron that is direct dyed and the cotton dyed with direct or developed dyestuffs. The latter black is described as being "hungry" or "shallow" in a direct comparison, all other process variables being equal. The major difference in tested properties is in crock-fastness, and to a somewhat lesser degree in light-fastness. It is in these two properties that the denser black is slightly inferior. Perhaps herein lies the key to an explanation.

CARRIERS

Carriers should be selected for the temperature ranges at which they are expected to operate. The solvent-emulsified types perform well in the 185-195 F range. The mixture types, solvent-solid combinations, are preferred for the 190-200 F range. The solid types, phenolates and benzoic acid derivatives, work best in the 200-210 F range.

Preference of a carrier for clarity of shade is significant only when a single color dyeing for Dacron is being attempted. Should any shading color be added to dye the Dacron, or should any color be added to dye the cotton, the differences that carriers would produce are obscured.

Should clarity of shade in repeated production be a problem, it is suggested that the previous heat exposure history of the fabric be examined, for it is known that the exposure of Dacron to higher temperatures, though not necessarily in the heat-setting unit, may cause a duller shade.

In any valid comparison of carriers in plant processing, identical preparation of goods should be strictly adhered to. The presence of an aromatic solvent, especially a chlorinated one, in the solvent scour may work as a carrier pretreatment and hence prevent a proper conclusion.

When attempting to use an established spun Dacron dye formulation for filament Dacron on the same equipment, a change in carrier is usually called for. The added length of time required to achieve the same shade on the filament Dacron makes the volatile, solvent-type carriers inconvenient to use. Also, the risk of uneven dyeing is greatly increased when the spent carrier has to be replenished at relatively high temperatures.

The differences in shading ob-

tained when a three-color formulation is used on the spun Dacron portion of a blend with a solvent-carrier versus a solid carrier are very noticeable. The following differences on dyeing were noted when spun Dacron was dyed in the presence of the different carrier types in separate baths, each containing the following three dyes formulated in varying ratios:

Eastman Fast Blue GLF (Pr 619)
Celliton Fast Yellow G (Pr 242)
Celliton Fast Pink B (Pr 234)

Ratio	Solvent Carrier	Solid Carrier
1/1/1	Dusty rose gray	Neutral gray
1/5/1	Light red-brown	Yellow-brown
1/3½/1	Reddish olive	Olive

When the red component is removed and two-color formulations are used to match to greens, differences between carriers cannot be noticed.

OTHER PROCESSES

Heat Setting. Except where the blends are dyed at temperatures higher than the boil, heat-setting before dyeing should be avoided. Clarity of shade is thus maintained and pin-holding bars or clip marks, if heat-set on enclosed frames, are avoided. Effects of uneven heat exposure before dyeing, being much more severe than after dyeing, are not risked.

Singeing. Blacks, navies and browns may be singed before dyeing. The fused balls of Dacron, though probably dyed much darker than the yarn in the fabric body, are obscured by the background coloring.

On the other hand, light and medium shades should not be singed before dyeing. The fused Dacron stands out almost like a dye-agglomerate speck. Much very close brushing and shearing would be required to correct this speckled condition.

In summary, unless the singeing equipment has adequate flame height, and tension and speed are carefully controlled, the finisher will complain of hand variations. He will complain of "sandy" or "gritty" hand on his dark shades.

It is ideal and practical, therefore, to singe all Dacron blends after dyeing at established settings and speeds without regard to fabric coloring. Differences in hand from this source are thereby eliminated.

Formulations. Here are some typical recipes for dyeing 65/35 Dacron/cotton:

1. Developed black on Dacron; Formaldehyde Black after-treated on cotton.

1200 yards (300 lb)—11 pieces on jig.

65% Dacron/35% cotton, solvent and caustic scoured.

Set 40 gallon bath at 120 F with:

3 gallons Tanavol carrier, run 2 ends at 120-130 F, add

2.0% Cibacete Diazo Black B ex conc (6 lb) over 2 ends.

Close jig and dye for 2½ hours at 205 F.

Open jig, cool to 195 F and add

3.0% B.O.N. previously dissolved with NaOH and neutralized to pH 8 with acetic acid (80%) over 2 ends.

Add approximately 1.0% sulfuric acid to pH 4.5 over 2 ends.

Run 2 ends at 195 F. Overflow rinse and wash at 130 F.

Add 8.0% sodium nitrite and 10% sulfuric acid to bath at coldest possible temperature.

Raise to 140 F and run 2 ends at 140 F.

Rinse and dye cotton with Formaldehyde Black.

Aftertreat with formaldehyde and acetic acid.

2. Dacron Black — modified azoic method. Cotton Black—vat dyed.

1050 yards (225 lb), 65% Dacron/35% cotton.

Dyed in jig, 60-gallon volume. Set bath at 130 F with

0.5% Avitone T

1.25% Naphthol AS-D supra, dispersed in

4.5% Tanavol

2.0% Cellitazol NSD ex

Run 2 ends at 130 F.

Run 2 ends at 180 F. Raise to boil over 1 end.

Run 2 ends at boil. Open jig, cool to 195 F and add 4.5% Tanavol, run 2 ends, add

4.5% Tanavol with 0.63% Naphthol AS-D supra dispersed therein.

Run 4-6 ends at boil. Drop bath and wash 4 ends at 150-155 F with 0.5% Igepon T gel.

Dye vat black in conventional way. Diazotize with

5% sodium nitrite

5% sulfuric acid

Start cold, run 1 end to 180 F. Run ends at 180 F, add

2½% sodium nitrite

2½% sulfuric acid, split over 2 ends at 180 F.

Drop bath and cold wash 2 ends, add

5% soda ash

1% Igepon T gel and scour at 180 F. Rinse.

3. Dacron red — modified azoic method. Cotton red—pad dye.

2500 yards (1200 lb)—30 pieces —box dye.

50% Dacron / 50% cotton, bleached, mercerized, and heat set.

Set bath at 120 F with

12 lb Avitone, run 10 minutes, add

15 lb Naphthol AS-OL (pasted with 12 lb alcohol and dissolved with 6 lb caustic (50%), run 10 minutes and add

12 lb acetic acid (65%), run 10 minutes, add

80 lb Carolid—run 10 minutes add

25 lb Fast Red B Base, run 15 minutes.

Raise slowly to boil over 1 hour and boil for 1 hour.

Cool to 180 F and give good overflow rinse. Drop bath. Refill and raise to 160 F, run 10 minutes. Give good overflow rinse and reset bath at 100 F. Add

48 lb sodium nitrite, run 5 minutes, add

60 lb hydrochloric acid, run 5 minutes.

Raise to 180 F in 45 minutes, run 15 minutes.

Give overflow rinse and reset bath. Add

24 lb liquid caustic (50%)

Raise to 200 F and add

24 lb hydro, run at 200 F for 30 minutes.

Give good overflow wash and a 10-minute hot wash at 150 F.

Cotton is dyed pad-jig with Naphthol AS-SW and Fast Red PDC salt.

Conclusion. When treating in the space allotted, a subject as broad in scope as the dyeing of synthetic fabric blends, it is assumed that all aspects cannot be treated in great detail. However, an effort has been made, by restricting the discussion to fewer blends, to bring out the important factors which influence choice of dyeing equipment, the development of formulations, and the establishment of processing techniques, all of which in turn influence final results.

Whether viewed from the standpoint of the cotton processor or synthetic finishing plant, the dyeing of synthetic fabric blends has become a specialized art. But it is an art that requires constant reappraisal in the light of changes that come forth through continual development work.

Printing the man-made fibers

by Herman P. Baumann
Manager, Textile Products Development
Chemicals and Dyestuffs Division
Koppers Co., Inc.

Exclusive

PIGMENT PRINTING

Printing with pigments has increased. There have been notable advances in emulsion techniques, and inventions in the range of the pigments themselves have added to the flexibility and diversification of their use.

The art derives from the original conception of using an oil-soluble unpolymerized resin, such as butyl melamine formaldehyde, as the basis for formation of a water-in-oil emulsion. This serves the dual purpose of providing a printing vehicle, replacing the conventional gum thickening, and also, on curing the resin, providing a binder for the pigment. Later, other resins have been incorporated into the print emulsion—first an alkyd resin for cross-linking, for softness and to improve fastness to laundering, and secondly a synthetic latex to improve fastness to crocking.

The choice of pigments entails a consideration of certain specifications. A pigment, to be suitable, must be of good tinctorial value, that is, must fall within an economic range of color productivity; it must be bright; of pleasing shade; fast to light, to washing, and to acids and alkalies; must not sublime under temperatures of curing or ironing; and must be insoluble in dry cleaning solvents.

The emulsion vehicle must be related to the pigment and the fiber in such a way that it releases the pigment and binds it to the fiber. Modern resins yield bright colors because they do not mask the pigment. Some resins, such as polyethylene emulsions, provide plasticity.

It is no disparagement of the inventors of the pigment emulsion printing technique that the art should be greatly implemented by the discovery at about the same time of the bright phthalocyanine blues and greens.

Pigment Emulsion Systems. There are two general classes of pigment emulsions—the water-in-oil system, and the oil-in-water system. They are sometimes called the oil system and the water system, respectively, according to the outside phase.

A study of the two systems leads to these comparisons: The water-in-oil system requires no thickening agent, uses about 30% mineral spirits, cleans only with soap or oil emulsion, clogs sewage, and yields high tinctorial value because the emulsion breaks on the fiber. The oil-in-water system requires a gum thickening, uses about 50% mineral spirits, cleans with water only, does not clog sewage, and yields lower tinctorial value because the emulsion penetrates into the cloth.

As a consequence, prints of equal depth generally exhibit more pronounced crocking tendency in the oil-in-water system.

The pigment emulsions can be applied to all fabrics, with great success on most of them, to a lesser degree of success on others. Where fastness to crocking is a prime consideration, as on chair covers, they might be undesirable. Because they bind well on most fabrics, the pigment emulsions are applied on mixed fiber fabrics where conventional dyes are apt to exhibit cross-dye effects.

Only on Dacron fabrics, and on shiny constructions of acetate or nylon, such as satins and taffetas, do the pigments show to poor advantage, not only because of low crocking fastness, but because they exhibit a mat print on a lustrous ground.

With their diversified applicability, their relative simplicity of handling, and their immediate visibility on the cloth, pigments are reaching into every phase of the synthetic fiber printing industry. Their continued acceptance by the public will be determined by the prudence of those responsible for

the uses to which they are put.

VAT PRINTING

Vat dyestuffs offer the highest consistent all-round fastness properties of any dyestuff group. They may be printed on viscose, nylon, acetate, Bemberg, and on synthetic fiber blends with cotton and silk. They are valuable as application colors, and as discharge colors.

In the conventional method for printing vat dyes on rayon, the dyestuff is incorporated in an aqueous alkaline paste containing a reducing agent (sodium sulfoxylate formaldehyde) and sometimes a humectant.

For thickening agents, those yielding highest color value are preferred, but consideration must also be given to the flow of print paste in the machine and ease of washing out after aging. For cotton and rayon printing, starch mixtures are often used, together with British gum or gum tragacanth. There are excellent converted starches on the market which make ideal thickeners for that purpose.

Essential to the reduction of the vat color is a reducing agent, such as sodium sulfoxylate formaldehyde. This is incorporated in the gum before printing. The necessary alkali is supplied by using potash or a mixture of potash and soda ash. The potash has a much better solubility than soda ash, and is hygroscopic, for which reasons it is preferred. Caustic soda is seldom used in conventional printing.

Additions which accelerate the reduction and fixation of the vat color during the aging process are sometimes made to the print paste. Effective hygroscopic agents are glycerin, diethylene glycol, and thiodiethylene glycol. Other compounds which exert a favorable action either by the fact that they are catalysts or hydrotropic agents can be used in small quantities, although in most cases the proper compound has already been determined and incorporated in the vat dyestuff paste as sold by the manufacturer.

After printing, the material is dried and aged. The aging process is an important function and a critical operation in the proper fixation of the dyes. The steam should be supplied without superheat in order to obtain the proper saturated condition. It must be air-free to insure complete reduction. In order to maintain these conditions in the ager, the steam supply must be adequate.

The prints are aged for five to eight minutes, then washed first with mild oxidizing agent, then in water, soaped hot, and rinsed again. The soaping is an essential part of the fixation of the vat color.

In the case of dyed naphthol grounds, the discharging print paste should contain a small quantity (about 1%) of anthraquinone, which can be dissolved directly in the final print paste. This compound acts as a reduction catalyst.

It has been found that excellent fixation of vat colors can be obtained on silk blends without physical damage to the fiber and it is only with vat colors that washable prints can be produced. In order to insure that the silk is not damaged, a soft gum must be used, and for this purpose gum tragacanth is recommended to replace the brittle starches and British gums. The quantity of potash should be no higher than 100 lb for 1,000 lb vat gum.

Most of the vat colors which are suitable for cellulosic fiber printing can also be printed on nylon, but the light fastness of the prints is much poorer. For some purposes, such as for slips and pajamas, where wash fastness is more important than light fastness, the vat colors are acceptably applied. The formula for printing is the same as for cellulosic fibers.

Precautions to be noted are as follows:

Nylon fiber has a low moisture absorption so it is recommended that shallow engravings be used, and further, that no hygroscopic agent be added to the print paste.

The reduced prints as received from the ager are very sensitive to light. Prints should be kept away from light before washing. The complete oxidation of Vat Red Violet RH is extremely difficult, so its use in nylon printing should be avoided.

The vat dyestuffs are admirably suited for the production of color discharge prints on rayons dyed with dischargeable colors. The formula for their proper fixation contains the discharge agent, sodium sulfoxylate formaldehyde. It is only necessary that precaution be taken to insure a sufficient quantity of reducing agent in the print paste. Generally a concentration of 150 lb per 1,000 lb vat gum will be found sufficient to discharge the ground shade.

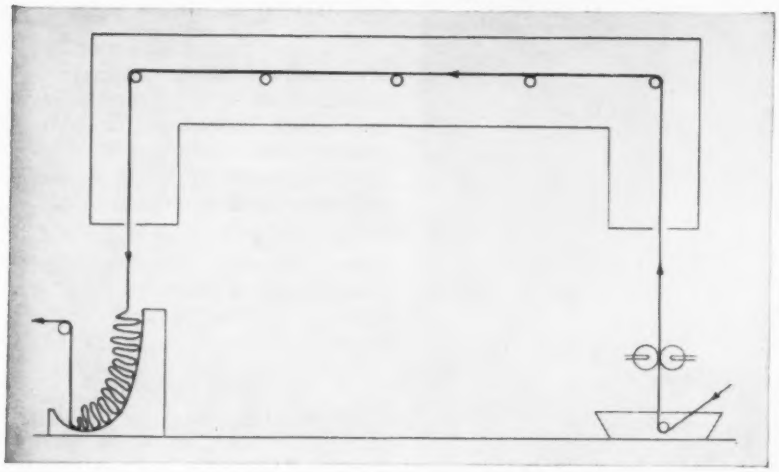
Flash Method. The printing of vat colors on rayon by the flash method is gaining in popularity. The use of the flash method, because of the nature of the process, offers the advantage that many dyestuffs of excellent light fastness, which do not lend themselves to the potash-sulfoxylate method, can be fixed. This broadens the scope of selection and permits the application of a wide range of extremely light-fast dyes. A further advantage which this method offers is the storability of the prints prior to fixation without danger of deterioration by moisture absorption and heat.

The vat colors are applied without chemicals and the prints are dried. The material is then passed continuously through a range, the first portion of which is a padder containing caustic soda and sodium hydrosulfite. This is followed immediately by a short ager where the wet prints are reduced. Oxidation, rinsing, soaping and rinsing follow.

The aging time can be as short as 30 seconds, which is a saving in space over the 5- to 8-minute aging of the potash method, in that a shorter ager is needed.

It is obvious that printing by the flash method must be applicable to white grounds only, since the padding with caustic soda and sodium hydrosulfite will destroy any ground color. However, the ground may be tinted in pale shades after printing. In fact, the vat color for this tinting operation can be applied in the caustic-hydro pad liquor.

Emulsion Printing. In emulsion printing of vat colors the oil-in-water emulsion replaces the conventional thickening agent. The process is a natural outcome of several stages in the recent development of printing. The first stage in this development took place when screen printers turned to



Flash method of applying vats to rayon offers wide selection of dyes of excellent light fastness, many of which cannot be printed by the potash-sulfoxylate method. As seen above, screen or roller printed fabrics are padded in caustic-hydro and instantaneously aged. In mill practice, padding, aging, oxidizing, and washing are done in a continuous operation.

flash aging for development of large blotch patterns. In flash aging, the conventional gum thickeners were replaced with gums which would congeal in the caustic and hydro pad solution. However, the use of gum thickeners interfered in screen printing where colors overlapped and also slowed down the screen printing process by necessitating drying between screens.

It was noticed that colors applied in emulsion form obviated these difficulties. Thus it was logical to attempt to replace the gum thickenings with an emulsion. While this emulsion may not be ideal for the flash method of aging, it offered such advantages as shortening the drying time between screens to almost nothing, and permitting overlapping of prints without blurring or mottling, so that the oil-in-water emulsion was tried as a thickener in the usual potash and sulfoxylate paste in machine printing as well as in screen printing.

Results have been signally successful. However, it has been found that the vat dyestuff itself must be prepared for marketing in a special way to be compatible with the oil-in-water emulsion.

Several advantages are claimed for this technique:

Greater bulk of the printing medium, thus giving greater yardage per pound.

Brighter shades and increased strength.

Sharper mark.

More rapid oxidation of the dye in the oxidation bath after aging.

Softer hand of the soaped prints, resulting from complete removal of the small amount of water-soluble gum deposited on the fabric by the emulsion. This factor is very important in the resin finishing of printed goods.

Print machine back-greys are easier to wash, since very little gum is deposited on them by the emulsion.

Rapid penetration of the printing color into the fabric in screen printing. This factor allows almost immediate overprinting in the case of multicolor patterns.

Print pastes are made up by mixing an oil (a low KB value hydrocarbon solvent) into a water solution of an alkali (such as soda ash) and a strong reducing agent (sodium sulfoxylate formaldehyde) with the aid of a high speed agitator. The emulsion must be bodied with a gum to maintain stability and provide proper flow characteristics. (U.S.P. 2,597,281—American Cyanamid).*

Many emulsifying agents have been tried, with varying results. One good agent is sodium lignin sulfonate solution. It has been found that glycerine and glycols are not desirable in the emulsion but that sugars can be used as substitute drying regulators; also that potash, being more hygroscopic, yields fuller prints than soda ash.

One of the disadvantages of the emulsion system and its chief drawback is the poor stability of the printed vat dye on the fiber (before aging). Yield of the dye on the print cloth deteriorates rapidly in the time it lies before aging, so much so that 50% of the strength can be lost in six hours. An addition of sodium hydrosulfite to the print paste has been advocated to correct this tendency.

Another system has been proposed, using the combined techniques of the emulsion printing system and the flash method of aging. This system eliminates the hazards of vat color deterioration by transferring the reduction of the dye to the padding-aging operation, at the same time reaping the benefits of the eumlsion process. If, instead of the oil-in-water emulsion, the water-in-oil emulsion is used, no gum thickening is necessary. This is the Savagraph Process (Du Pont).

The urea method of printing rayons with direct dyes has long since been over-exploited. Where the system fails is in the application of bright direct dyes on rayon fabrics which must withstand washing and perspiration, as for wearing apparel. The method has merit for drapery prints, upholstery, and decorative material. The formula for printing is:

2 parts dyestuff
20 parts urea
78 parts water and gum

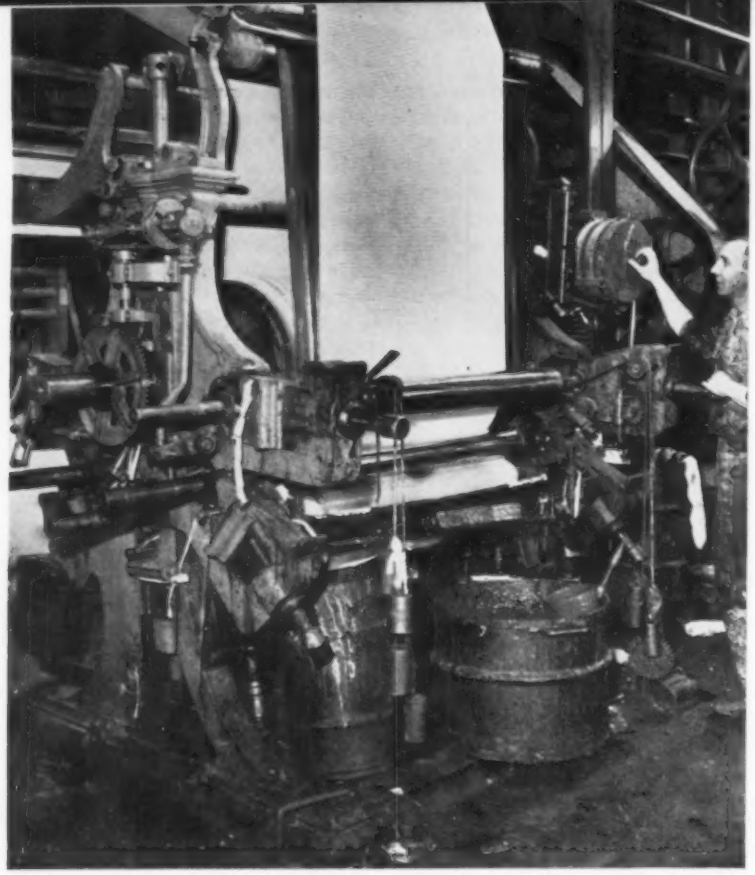
Prints are steamed for one hour and rinsed well. Aftertreatments with urea formaldehyde and melamine formaldehyde will improve the wash fastness considerably.

PRINTING OF ACETATE

Acetate fabrics can be readily application printed with the disperse dyes. These dyes are so manufactured that they do not require dispersing agents or solvents when preparing the print pastes. They are simply stirred well with warm water, thickened with gum, and printed. The printed and dried material is steamed 30 to 60 minutes with low pressure, or aged twice, then rinsed to remove the gum.

The only criteria which apply to the choice of the disperse dye are, first, the dispersibility; and

*This method is described in detail in the article, "Vat Printing at Eureka," which appeared in TEXTILE INDUSTRIES for August, 1957, pp. 103-105.—Eds.



Vat dyes offer highest all-around fastness properties of any dyestuff group. They may be printed on viscose, acetate, nylon, Bemberg, and on blends of these with cotton and silk.

second, the fastness to sublimation. Even this second criterion can be overlooked if the acetate is to be aged and not steamed.

Sometimes additions are made to the print paste to further the fixation of the dye, such as urea, thiodiethylene glycol, or Carbitol. In printing light blues and violets which exhibit the phenomenon of gas fading, additions of durable gas fading inhibitors can be made to the print gum.

Although basic and acid colors have little affinity for the acetate fiber, these dyestuffs can be printed on acetate cloth with the aid of a swelling agent. A typical formula for a basic or acid color print is as follows:

2 parts dyestuff
4 parts thiodiethylene glycol
37 parts water to dissolve
50 parts textile gum
5 parts urea
2 parts ammonium sulfocyanide

By using this technique, bright fluorescent pinks are printed with the Rhodamines, while pale shades of excellent light fastness can be obtained with selected acid dyes.

Vat dyes yield fast prints on acetate. As swelling agent, sodium sulfocyanide is used, added to the other ingredients of the regular vat formula.

Discharge Printing. Discharge printing of all-acetate fabrics presents many problems to the textile printer. Not only is the number of dischargeable dyes limited, but the hydrophobic nature of the fiber complicates the problem by producing halos around the print pattern, fuzzy edges, smeared color, and generally poor crocking fastness. Still, the challenge has been met, with the result that a great deal of acetate cloth has been discharge printed, with innumerable formulations.

To produce a white discharge print, three directions lie open to the printer. The first method employs zinc sulfoxylate formaldehyde, either alone or with thiodiethylene glycol as additive in the print paste, as follows:

10 - 30% zinc sulfoxylate formaldehyde
5 - 10% thiodiethylene glycol
in textile gum

A derived formulation employs the familiar sodium sulfoxylate formaldehyde with zinc sulfocyanide added. Instead of zinc sulfocyanide, salts of zinc and of sulfocyanides might be used, as zinc sulfate and sodium sulfocyanide.

The third method, and one which has only recently found wide usage, is with the aid of thiourea dioxide. In spite of its name as an oxide, it is a strong reducing agent (U.S.P. 2,164,930—Du Pont-Lubs). It has limited solubility, which can be improved with thiourea. Prints are simply dried, aged, and washed.

Color Discharges. Color discharges are more difficult to obtain, especially on dark grounds such as brown, navy, and black. Vat colors can be used, and the formula suggested above for their application also produces color discharges on suitable grounds.

However, sharper and cleaner discharges with vats are made with zinc sulfoxylate formaldehyde without any alkali. In this case the free vat acid is formed by reduction and fixed on the acetate fiber instead of the alkali salt of the vat dye, and the resulting prints exhibit different shades and fastness properties (B.P. 702,056 and B.P. 702,075 — Krug-Hardman & Holden). For example, Vat Golden Yellow GK yields a lemon yellow, and Vat Jade Green a blue. Algol Red 5B (Ciba Pink B) yields a bright pink.

While this method shows the advantages of good running pastes in the machine, lack of halos, and sharpness of color, the resultant prints do not have good crocking fastness, nor do the vat colors have the high light fastness which is normally found on cotton. Print pastes are not stable and the goods must be aged immediately after printing and drying. A variation of this method employs sulfoxylate formaldehyde, thiodiethylene glycol, and an alkali thiocyanate (U.S.P. 2,289,461—Celanese Corp.).

Vat colors also find use as color discharge dyes with thiourea dioxide as discharging agent. In this case also, the vat colors are printed

without alkali. A typical formula is:

75 parts dyestuff
60 parts diethylene glycol
50 parts thiourea dioxide
100 parts urea
40 parts water
675 parts British gum-gum trag thickener

The prints are dried, aged, and washed. The above formula will be found applicable on light ground shades. On deeper grounds, the thiourea dioxide will have to be increased (U.S.P. 2,206,535 — Du Pont-Lubs; and U.S.P. 2,248,128—Celanese-Seymour-Salvin).

Other dyes than vats also find use as color discharge prints. Basic dyes such as Nile Blue BX and Phosphines can be printed with zinc sulfoxylate formaldehyde. Only a few basic colors are stable to the destructive action of this reducing agent.

It has been proposed that the thiourea dioxide be employed as a reducing agent together with an alkali and so bring the vat color into the leuco state, then to neutralize with an acid before printing (B.P. 702,040-41—Krug, Hardman and Holden).

Another method of applying vat colors on acetate in color discharge printing is to use thiourea dioxide along with thiocyanates or with alkylolamines. Halos are more readily formed by this formulation, and dark ground shades are not so easily discharged, but the yield of the vat dye is increased.

Although thiourea dioxide provides an interesting method for the production of color discharge prints on acetate fibers, its success depends on careful manipulation and control, both in the formulation and in the handling of the printed material. Each print paste must be studied for the proper amount of thiourea dioxide, as insufficient quantities will fail to discharge the ground shade and excess quantities will form halos. Furthermore, this chemical is sensitive to heat. requiring careful control of the temperature of drying the goods.

PRINTING OF THE SYNTHETICS

Acrylics. Acrilan can be satisfactorily printed with disperse, basic, and acid dyes. Several constructions of 100% Acrilan have found favor on the market, some of these requiring application print patterns. Generally, the Acrilan has been dyed in pastel colors, and then overprinted by screen printing.

Screen printing uses essentially the same dyes as roller printing, but more print paste is applied and so lower concentrations of dye are needed. Screen prints are usually brighter.

A typical formulation of the application of disperse dyes is the following:

2 parts dyestuff
6 parts ethylene glycol
42 parts water
50 parts alginate thickening

Prints are steamed for one hour with 5 lb pressure, then rinsed.

A modification of this formula is employed for application of acid dyes:

2 parts dyestuff
5 parts ethylene glycol
7 parts urea
34 parts water
50 parts gum tragacanth thickening
2 parts tartaric acid

Prints are preferably steamed 15 minutes or longer at pressure of 10 to 15 lb. It has been found that at pressures of 20 lb penetration could be accomplished in five minutes, though longer steaming times are recommended for uniform fixation.

Acrilan-wool blends are preferably printed with basic-type colors. The procedure is generally as follows:

2 parts dyestuff
6 parts ethylene glycol
4 parts urea
38 parts water
50 parts alginate thickening

Prints are steamed at 5-10 lb pressure for one hour. This formula produces good detail on Acrilan-wool. The wool is not colored as deeply as the Acrilan, but the over-all effect is excellent on 70/30 or 80/20 blends. Wash fastness of the basic colors is very good, so that vigoreux or slubbing can be printed satisfactorily with these dyes.

While vat dyes, soluble vat esters, and naphthols have been successfully used to dye Acrilan, little has been done to develop these color classes in printing. However, they should have a potentially important future.

Orlon has been application printed with disperse dyes in a manner similar to acetate. The prints are steamed up to one and

a half hours with pressure.

Brighter and stronger colors are obtained with the Sevron type dyes (Genacryls, Astrazones). The dyes are dissolved, thickened, and printed with an organic acid, after which they are dried, then steamed 1½ hours under ten pounds pressure. Blends of Orlon and wool are particularly responsive to this group of colors.

Dacron Polyester. Dacron presents a problem, since so few dyes will fix well on it. The disperse dyes, if selected for high fastness to sublimation, will be found satisfactory, although the range of available shades leaves some gaps in the bright shades. Prints must be steamed under 10-15 lb pressure, with paper greys between the folds of the Dacron.

Darvan reacts similarly, and is printed with the disperse dyes.

Arnel also accepts the disperse dyes. Pressure steaming is required for this fiber also. Prints should be washed well after steaming, and the Arnel given a heat treatment to insure highest wash fastness.

In all the above steaming procedures, where pressure is advocated, care must be taken to insure freedom from creases as such creases will be permanently set in the cloth during the prolonged steam conditions. Sublimation of colors must be guarded against by suitable interlayers of grey cloth or paper.

Nylon. Nylon is a most versatile fiber, having affinity for some dyes of nearly every printing group. Furthermore, since printing is an effective method of forcing dyes onto a fabric, many colors which show low affinity in dyeing can be successfully applied on nylon in printing.

Of the dyestuff groups which can be considered for printing nylon, we can mention disperse dyes, vats, many direct colors, some basics, most acid and chrome dyes, and the premetalized acid colors. Printing with pigments has been described previously.

The hydrophobic nature of nylon must be taken in consideration not only in formulating the print pastes, but in the actual engraving of the rollers. The engravings must be shallow to prevent excess deposit of color in order to minimize smearing of the print during aging, and bleeding during the washing operation. Similarly, the gum thickener should be chosen to yield sharp, dry impressions.

Disperse dyes are readily applied on nylon in printing. They need no special assistants, but urea or diethylene glycol aids in promoting smoother prints and fuller shades.

In washfastness on nylon, the disperse dyes are equal or somewhat better than on acetate, but in most cases are inferior in light fastness. They are not fast to perspiration, and will not meet the demands for washable nylons. There is little danger of gas fading of disperse dyes on nylon, but few possess resistance to sublimation in heat setting.

Prints are made by dispersing the dyes in water and adding to the gum containing 5% urea. The prints are steamed 45 minutes and washed.

Premetalized acid colors exhibit good affinity for nylon and many acid colors can be printed in full and medium depths with good fastness properties. Colors are applied from a print paste containing an acid forming salt, such as ammonium sulfate. Sometimes urea or thiodiethylene glycol is added to promote fixation. Prints are steamed one hour, or aged twice, then washed well. Several direct dyes also yield satisfactory prints on nylon.

Every once in a while there is a demand for a fluorescent pink print, which in the case of nylon is readily satisfied by printing Rhodamine with thiodiethylene glycol or ammonium sulfocyanide. Other basic and chrome colors also are used for special effects.

Where wash fastness is essential, chrome colors printed with chromium acetate mordant can be successfully applied. The prints must be steamed one hour for complete fixation.

In many cases vat colors are used, especially for small patterns on underwear or pajama nylons, but the vat colors do not show good light fastness on this fiber. The subject of vat color printing on nylon has already been treated in earlier paragraphs.

Discharge patterns on nylon suffer from two major difficulties. In the first place, dischargeable dyes of the direct and acid groups exhibit warpy effects on nylon piece goods. While these dyes give the most satisfactory results for light and wash fastness, many disperse acetate colors are used because they level well and do not tend to barré. These disperse colors have limited fastness to washing and perspiration.

Another difficulty is the extreme hydrophobic nature of nylon which causes colors to spew and show halos; this property also prevents the use of sodium sulfoxylate formaldehyde as discharging agent, and requires the printer to turn, as on acetate, to involved processes. These processes have been described previously for discharge printing of acetate fabrics, and include the use of either zinc sulfoxylate formaldehyde or the methods of thiourea dioxide, all of which are acidic in reaction, and difficult to control. It is sometimes necessary to formulate each discharge color print in another manner.

The fibers mentioned here include all those which have received any commercial development in printing, up to the present. It is expected that new fibers such as Verel, Zefran, and Creslan will receive extensive attention in the near future.

Blends. Little has been said of mixed fiber fabrics. As new fibers are developed, the number of possible fiber combinations increases rapidly, and there are always those who cannot resist experimenting with new blends or new fiber effects.

Sometimes these mixtures must of necessity defeat their own purpose, as in weaving acetate with Arnel—the fastness properties of dyes on Arnel are lost on the conventional acetate.

As for the printer, each construction must be studied in the light of known dye affinities, and the simple expedient of overprinting with pigments or lacquers is not always the best solution. There is an urgent necessity for the textile engineer to consult the dyer and the printer and to consider their problems as an integral part of the fabric blueprint.

Finishing the man-made fibers

by Hector C. Borghetty*

Exclusive

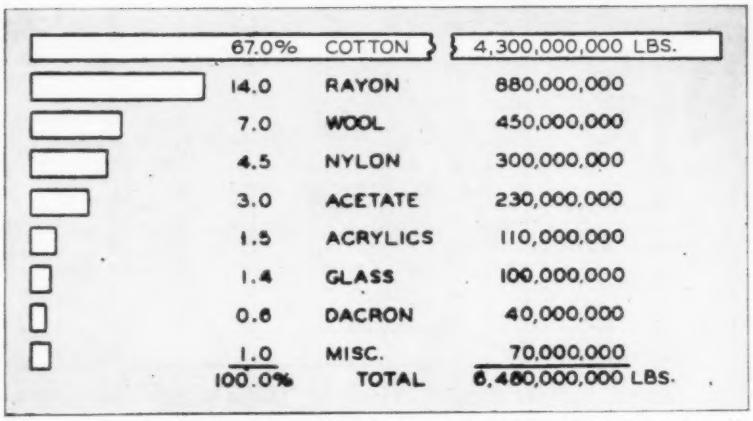


Figure 1. U.S. textile fiber production in 1957 (consumption figures for cotton and wool).

THE UPWARD trend of growth in fabrics made from synthetic fibers continues and shows promise of further increase for the years ahead. Nylon, Dacron, and the various acrylic fibers have proved to be satisfactory for many uses and they are being steadily supplemented by plant expansions and new trade names.

Many major chemical manufacturers not formerly in the textile industry are apparently convinced that the future of this industry resides in man-made fibers. In entering this present lucrative market, they are emphasizing the polyamide and the acrylic fibers and are not introducing radically different chemical types. The offering of modifications of those fibers that have had ample and successful consumer acceptance is a rather fortunate decision, because it does not further complicate the already intricate structure of the finishing of the fabrics made from synthetic fibers.

The years between 1946-1955 were greatly complicated by much experimentation on many new fibers and their blends, by many new dyeing techniques, and also by new merchandising practices. During the past three years, however, a good balance has been finally achieved among manufacturers of fibers, weavers, finishers, and distributors of fabrics made from the new and truly synthetic hydrophobic fibers. This breathing space has permitted standardization of production methods and has made possible that all-important amalgamation of knowledge that enables the various segments of an industry to solve their problems.

To obtain a clear perspective of the position of man-made fibers it is well to study the relative production of the various fibers and to observe their rate of growth compared to the natural fibers.

The older group of synthetic fibers, comprising rayon and acetate, attained during 1957 the significant volume of 1,139,400,000 lb in the U.S.A. This rate has already far exceeded the total for wool and is growing rapidly at the expense of the growth of the natural fibers. The combined production of rayon and acetate is 17% of the total for all textile fibers.

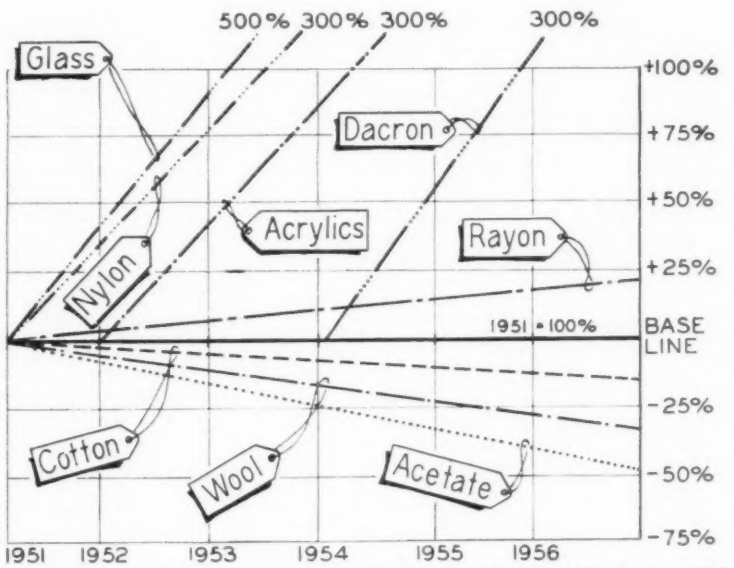


Figure 2. Trends of fiber consumption in the United States, 1951-1956 (1951 equals 100%).

*Formerly with Rohm & Haas Co.

Figure 1 shows the total production of all types of fibers in the U. S. and illustrates the relative percentage of each in relationship to cotton. While cotton at 67% still represents the great bulk of the textile fiber business, that it is being challenged by the man-made fibers is more than apparent by the poundages shown.

A more important indication of the inroads being made by synthetics can be obtained by comparing the trend of growth since 1951 of all fiber groups. *Figure 2* indicates that cotton has lost its dynamic growth character and no longer parallels the expansion expected according to population increase.

With these trends in mind it becomes evident why research is placing so much emphasis on improvements in the dyeing and finishing of synthetic fibers, as well as in their manufacture. It also becomes logical that any really creative research activity given to synthetic fabric finishing is destined to succeed as the growth of the man-made fibers comes to fruition. It is probable that the incentive given by the present upward growth has brought about the satisfactory solution of many finishing problems that existed a few years ago.

FINISHING OF DACRON

Dacron typifies the truly hydrophobic fiber and possesses to the highest degree yet attained those thermoelastic properties that impart intrinsic wrinkle resistance. Its high hydrophobicity and consequently low swelling in water, low moisture regain, and quick drying give excellent wash-wear character to all fabrics of Dacron. This fiber can be considered as "self-finishing" because it necessitates no further improvements of character by addition of other chemicals.

The entire finishing operation of Dacron centers around the heat-setting treatment that accentuates the built-in self-finishing properties of the fiber. Heat-setting is carried out at temperatures up to 440 F, or at least 50 F higher than that to which the garments are later subjected during ironing.

The heat - setting operation should be given preferably to thoroughly cleansed fabrics and under uniform conditions to assure subsequent level dyeing. During heat treatment a rearrangement and a stabilization of the internal structure of the fiber occurs by a release of stresses in the molecular configuration. The natural tendency of the fiber to shrink during the high temperature treatment near its plastic flow range must be controlled by stretching or framing by pressure between rolls, or by relaxing in hot air dryers.

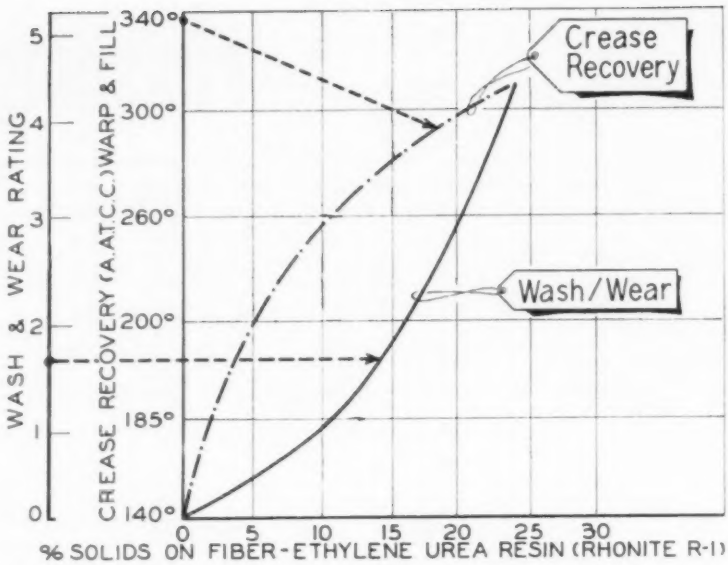


Figure 3. The effect of othylene urea resin concentration on the wash and wear rating and the crease recovery angle (AATCC method, warp and filling) of an all spun-rayon challis.

Static Control. The low moisture regain (0.4% at 70 F and 65% RH) which is a function of the excellent hydrophobicity of the fiber is also the reason for its poor electrical conductance. This causes build-up of static electricity that is one of the main drawbacks of the fiber, but which can be controlled, however, by padding with antistatic solutions. Durable type antistats have now been made available.

Pilling. Experience in the construction and merchandising of the correct type of fabrics for definite end uses his eliminated the incidence of pilling. Pilling occurs mainly on staple Dacron fiber or in its blends with other fibers, while the filament-type Dacron fabrics have been successfully merchandised in many constructions.

Blends of staple Dacron with wool or cotton to impart stabilization to either fiber are acquiring an even more important position on the market. Blends of Dacron and cotton do not withstand alkaline kier boil, but they can be mercerized or bleached and given the various other treatments required in cotton finishing.

The fabric constructions containing up to 65% cotton component have excellent and permanent wash-wear character. These combinations have had outstanding success for mens' white shirts and have only recently been challenged by resin treated all-cotton in this application.

ACRYLIC FIBERS

Orlon, Acrilan, Verel, and to a lesser extent dynel, have become increasingly important for many textile uses. They are of particular value in knitted garments, carpetings, and pile fabrics, and quite outstanding for fabrics for outdoor exposure and industrial uses.

In the finishing of fabrics made from acrylics many of the factors stated under Dacron apply, although to a lesser degree. Acrylics are truly hydrophobic fibers and possess the high wrinkle recovery required to be classified as "self-finishing." They also necessitate

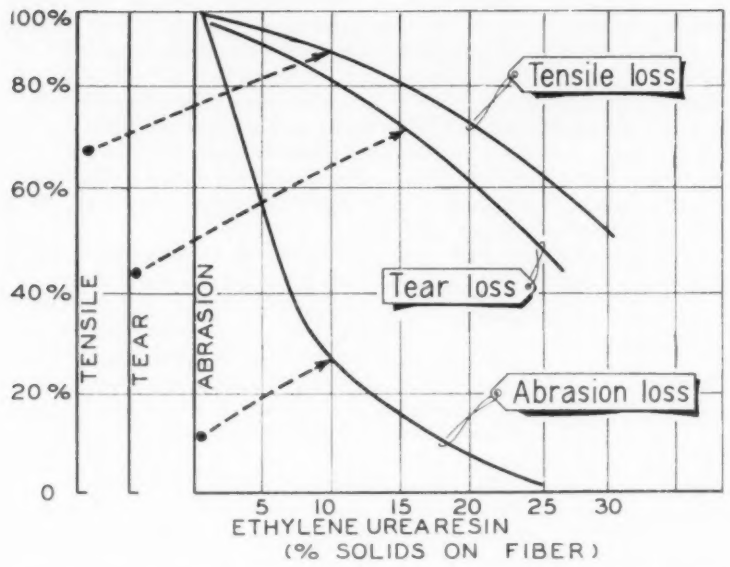


Figure 4. Effect of ethylene urea resin concentration on tensile strength, tear strength, and abrasion resistance of an all spun-rayon challis. Note steep curve of abrasion loss.

the heat-setting treatment and the addition of antistats to eliminate the electrical charge build-up.

Many new acrylic types are being introduced and very soon production of Creslan and Zefran will be added to the market. The new types should behave in similar manner to the present types and may differ principally in dyeing qualities and strength, but little in finishing requirements.

NYLON AND POLYAMIDES

Nylon has proved to be the most successful and most used of all the new hydrophobic fibers. *Figure 1* illustrates how it has surpassed acetate and is moving upwards towards rayon. This is an extraordinary achievement for a relatively recently synthesized fiber.

Until after World War II nylon was confined to hosiery yarns, a field it has since practically monopolized, and to certain industrial uses. Nylon output has recently been supplemented by large production from Chemstrand Corp. of the same chemical type (both are adipic or 66 type) and has now been joined by the modified type called nylon 6 (caprolactam) manufactured by American Enka Corp., Industrial Rayon Corp., and Allied Chemical Corp.

Nylon 6 is a form of the German Perlon, and therefore of somewhat lower melting point and greater affinity for dyes. These differences could lead to different behavior in dyeing and finishing and, therefore, much attention should be paid to segregation of types into selected fabric styles or lots. The "6" type staple has had particular success in the carpet industry, while all types are used extensively for industrial purposes, such as in tire cord, tarpaulin fabrics, and various beltings.

The finishing of all polyamide fabrics follows closely the outline given for Dacron. Good wrinkle recovery is still a characteristic but the wash-wear qualities cannot be considered sufficient. Although the polyamides are hydrophobic fibers, their regain of 4%-5% at 70 F and 65% RH is not low enough to place them in the wash-wear garment category.

The important qualifications of nylon lie in high strength and tenacity, good wrinkle recovery, high chemical resistance, and flexibility for blending with other fibers. Industrial uses account for much of the polyamide output, but fabric uses for both filament and staple are significant and of continuous upward growth.

Finishing operations of nylon are also based on heat-setting to capitalize on the thermoplasticity of the fiber. Antistatic treatments and application of softeners are customary as for other hydrophobics. Resin applications are common on nylon fabrics, particularly for firm crinoline-type finishes. Methoxy urea formaldehyde and melamine resins are applied at high concentrations to impart this latter type of finish. Flame-proofing additions are often made to reduce the incidence of fire hazards on the lightly textured and more paper-like finishes.

Nylon is a valuable component for blends with rayon to impart high strength, abrasion resistance and a certain amount of wrinkle recovery. It is also used extensively as a small component in woolen blends for the same reason, and has achieved prominence in combination with rayon or cotton. It has also become a valuable component to improve tensile strength and abrasion resistance of the upholstery fabrics used in automobiles or furniture.

Many of these fabrics are made nonslip by backfilling with thermoplastic resins that seal and stabilize the weave during the dyeing process or in actual wear. Thermoplastic binders are now available that are light resistant and also stable to the metalized dyestuffs required for the nylon component.

Natural and synthetic latices, when employed, have the drawback of dulling the shades during dyeing or finishing and embrittling on storage or light exposure because of the deleterious effect of the copper on the latices. The embrittlement is rapid for latex wherever copper-containing dyes are used, and occurs during the storage period with consequent destruction of the bonding qualities.

ACETATE FABRICS

After a slump in the early fifties, some improvement has been noticed in acetate production. This once most luxurious of fibers has been surpassed since the introduction of the truly hydrophobics in the very properties that once made it outstanding for linings, underwear, and dresses. High luster, full hand, and good wrinkle recovery can now be obtained with nylon or Dacron.

The hydrophobicity and wash-wear properties of acetate, as well as its fiber strength and colorfast-

ness, can be greatly improved by making it in the triacetate form now offered as Arnel. Arnel triacetate can rank in the wash-wear fiber group as a "self-finishing" fiber that requires the heat-setting operation and the techniques usually associated with Dacron and the other hydrophobics.

RAYON

This oldest and largest of all synthetic fibers is the work-horse of the entire group. Its growth has continued, as shown in *Figures 1* and *2*, and it is manufactured by many companies in both filament and staple forms. Its low cost and versatility render it satisfactory for dresses, sportswear, shirtings, linings, and other woven and knitted apparel fabrics, for home furnishings, and a variety of industrial fabrics, particularly tire cord.

Rayon production is divided almost evenly between filament and staple. Its dyeing and finishing qualities are simple and economical and it lends itself to changes of hand from very soft to firm with almost all types of chemicals.

Resin finishing to impart wrinkle resistance is practiced extensively on rayon and has been the main contributing factor to the success of all those fabrics that require dimensional stabilization and protection against abrasion and fraying during washing. Manufacturers of viscose have gradually introduced improvements in the tensile strength of the yarns and have substantially raised the wet strength over the 35 years since the fiber first went into large scale production.

Essentially, however, viscose rayon has remained practically unmodified chemically since its discovery by Cross and Bevan in 1892. The reason for this lack of radical improvement may be in the easy success of the viscose fiber and its enormous advantages for many textile uses. These advantages, however, are rapidly disappearing and will soon be challenged by the inroads of the many new fibers offered for dresses and underwear.

The impetus given by the success of rayon and acetate certainly keyed the chemical research that led to the development of nylon, Dacron, Orlon, and Arnel, but did little to stimulate research on chemically modified viscose itself.

The success of resins in finishing of rayon has not yet transposed to the intrinsic modification of viscose during the manufacturing process, but it is hoped that the attention of viscose manufacturers will eventually lead to a study of the many possibilities of adding chemicals during or directly after the spinning operation to impart dimensional stability and wrinkle resistance (1).*

Wash-Wear Rayon Sought as Finish. The qualities admired most in the hydrophobic fibers have meanwhile stimulated many finishers to develop wash-wear rayon fabrics. Although this has not yet been achieved, the indications are that the improvements recently made with resins impart greater wrinkle recovery and some minimum care aspects that should eventually lead to further hydrophobization to give lower water pick-up. This could lead to the necessary degree of recovery that would allow the fiber to smooth itself out during drying.

The problem of wash-wear rayon by resin treatment is not difficult because of the effect in itself; the difficulty resides in the drastic reduction in abrasion resistance as the amount of resin concentration is increased. The wash-wear character of a fabric is best measured by the drip-dry technique given by Lawrence and Phillips (2).

Figure 3 shows the effect of an ethylene urea resin on rayon to give wash-wear in relationship to crease recovery. Note the steeper curve for the improvement in crease recovery while the wash-wear lags.

It is evident from the curve that rayon can be rendered fully wash-wear if enough of a specific and very effective resin is added. Any enthusiasm regenerated by this data must dissipate, however, on comparing it with *Figure 4* which illustrates the drastic reduction of abrasion resistance at the concentrations of the same resin required to give a wash-wear rating of at least 3.

Although the tensile and tear strengths at high resin concentrations are still satisfactory, they do not compensate for the loss of abrasion resistance. Rayon is already so weak a fiber that it would be rendered unserviceable for any fabric use if the abrasion resistance drops so sharply.

Control of Abrasion Resistance With New Resins. Abrasion losses caused by use of thermosetting resins can be controlled by adding thermoplasts to the finishing solution. These additions, however, impart a heavy finish of low springiness, although a recent development has made possible new thermoplasts that substantially improve the wrinkle recovery and permit a fair amount of minimum care character.

This is illustrated in *Figure 5*, which shows the increase in abrasion resistance obtained by adding a fixed amount of two different reactive thermoplasts to a series of ethylene urea resin treatments.

It is evident that the addition of these acrylics controls the abrasion to permit the use of higher than normal amounts of thermosetting resin component. The effect, particularly of the soft reactive, enhances the crease recovery and gives a soft, springy hand. Whether the amount of abrasion control can be extended to give full wash-wear will depend largely upon the interest in this development by the rayon finishing industry.

Blends of Cotton and Rayon. Recent studies (3) indicate that spun blends of cotton and rayon can give fabrics of better crease recovery than those of pure spun rayon. The resin treatment of such blends imparts good wrinkle recovery without much loss in tensile strength and abrasion resistance. Experimental fabrics are at present being field tested.

NONWOVEN FABRICS

All synthetic fibers are participating as components in the new nonwoven fabrics that have recently entered the textile industry. This volume has reached the impressive level of 100,000,000 pounds annually and has vast fu-

*Numbers in parentheses refer to references at the end of this article.

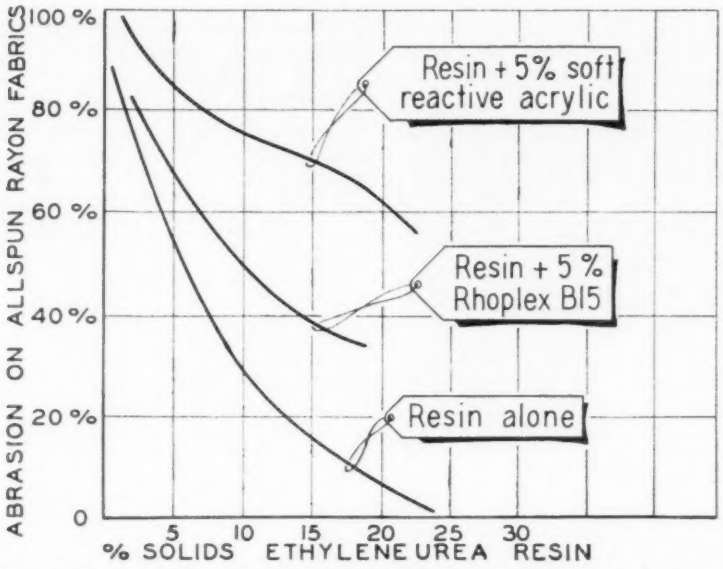


Figure 5. Abrasion losses caused by use of thermosetting resins can be controlled by adding thermoplast to the finishing solution. Above: Acrylic additives improve abrasion.

ture possibilities for all fabrics.

Although confined largely at present to interlinings, industrial wipers, disposable tissues, coated fabrics, and paddings, improved methods of manufacture and new resin binders are bringing improvements that have received attention in many other markets including that of the outerwear garments. Nylon and acetate are widely used in mixtures with rayon and cotton, while Dacron and nylon offer possibilities for stronger fabrics of good crease recovery.

Application of the binders takes place by spraying, coating, padding, or dipping, using thermoplastic and thermosetting resin or their combinations, and with polyesters. The binders can be applied to the nonwoven web either from water or solvent solution (4). Thermoplastic powders or fibers can also be used to bind by first mixing them into the nonwoven web and then subjecting the whole to heat or pressure. The selection of binders and their effects on different fibers in regards to adhesion and fiber bond requires intensive but very rewarding study.

The nonwoven development represents the most radical departure the textile industry has ever experienced and points the way to the utilization of many scientific tools that the industry has heretofore not been able to consider.

Our industry has often been accused of lack of scientific research and of complacency, but these accusations are no longer valid as the industry gears itself to new chemical fibers, intrinsic modifications of cellulose, streamlined dyeing and finishing techniques, and to chemical dyeing of cotton, already being practiced on a large scale. The multitude of successful blends for specific end use requirements more than prove that textile technologists have benefited enormously by cooperation with the chemical, plastic, and dyestuff industries.

The amalgamation of the many viewpoints shows promise of a future in which we can all participate.

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Trouble with split laps on "Orlon"? Try these tips

■ COTTON MILL operating executives will find many helpful suggestions for making 60s yarn from 1.0 denier 1½ inch "Orlon" staple in Du Pont Bulletin OR-86. Processing data, including machine settings, are given for the picking, carding, roving, spinning, and twisting operations.

Typical of the practical recommendations made is the following procedure for a fixer in the picker room to use in eliminating split laps:

1. Increase fan speed and adjust the baffles to blow the stock to the upper condenser screen, forming a one-layer lap. Even distribution of air pressure from side to side is very important.

2. The cut-off knife to beater setting should be close (1/16"). This helps deflect the stock toward the upper screen and prevents it from remaining in the beater section and becoming overworked.

3. Split lap preventers are required. The lower preventer may be set to within ⅛" or 1/16" of the calender rolls. The floating type can be used for the upper split lap preventer and should also be set fairly close to the rolls.

4. The calender stack load should be increased to about 1800 pounds on each side.

5. An oscillating comb on the vertical feed apron of the hopper will usually give a uniform feed.

6. A tandem feed hopper will be of considerable help in obtaining uniform feed and will provide sufficient preliminary opening before picking.

Tips for cotton mill processing of 2.0, 3.0, 4.5, 6.0, and 10.0 denier "Orlon" staple 1½ and 2 inches in length are contained in Du Pont Bulletin OR-78. Included are possible causes of various picking, carding, drawing, roving, and spinning difficulties, and suggestions for correcting them.

ZEFRAN* is an acrylic alloy fiber which has excellent physical properties, mill processability, and dyeing versatility. It is finding usage alone and in blends with natural and man-made fibers.

The fiber is white, with a round cross section; its physical and chemical properties are listed in the chart, "Properties and Uses of the Man-Made Fibers," which appears elsewhere in this issue.

Zefran can be differentiated from other fibers by the fact that it is dyed if treated at room temperature for three minutes with 1% Fastusol Pink BBA Ex Conc (CI 353) on the weight of the fiber, in a neutral bath. Other fibers are left white or are slightly stained.

*Trademark of The Dow Chemical Co.

COTTON OR SYNTHETIC SYSTEM

Zefran is a fiber designed to fit well into the cotton and synthetic systems of yarn manufacturing. It is made in 2d/f and 3d/f in bright and semidull lusters, in staple lengths of 1½" to 3" for the cotton or synthetic systems. Six-denier-per-filament fiber is available in staple lengths of 1½" to 3" for applications requiring a coarser hand, or for special effects such as blends for throw rugs and blankets.

An important characteristic of Zefran is its ability to blend well with other fibers, both natural and synthetic, to produce quality yarns. The content of Zefran should be at least 50% of the blend to obtain optimum performance qualities, such as wrinkle resistance and recovery, quick drying, light weight, etc.

Blending. The organization and settings for the cotton and synthetic systems are essentially the same as used for other fibers of the same denier and staple length. The fiber is opened before baling; therefore, harsh opening equipment prior to picking should be avoided.

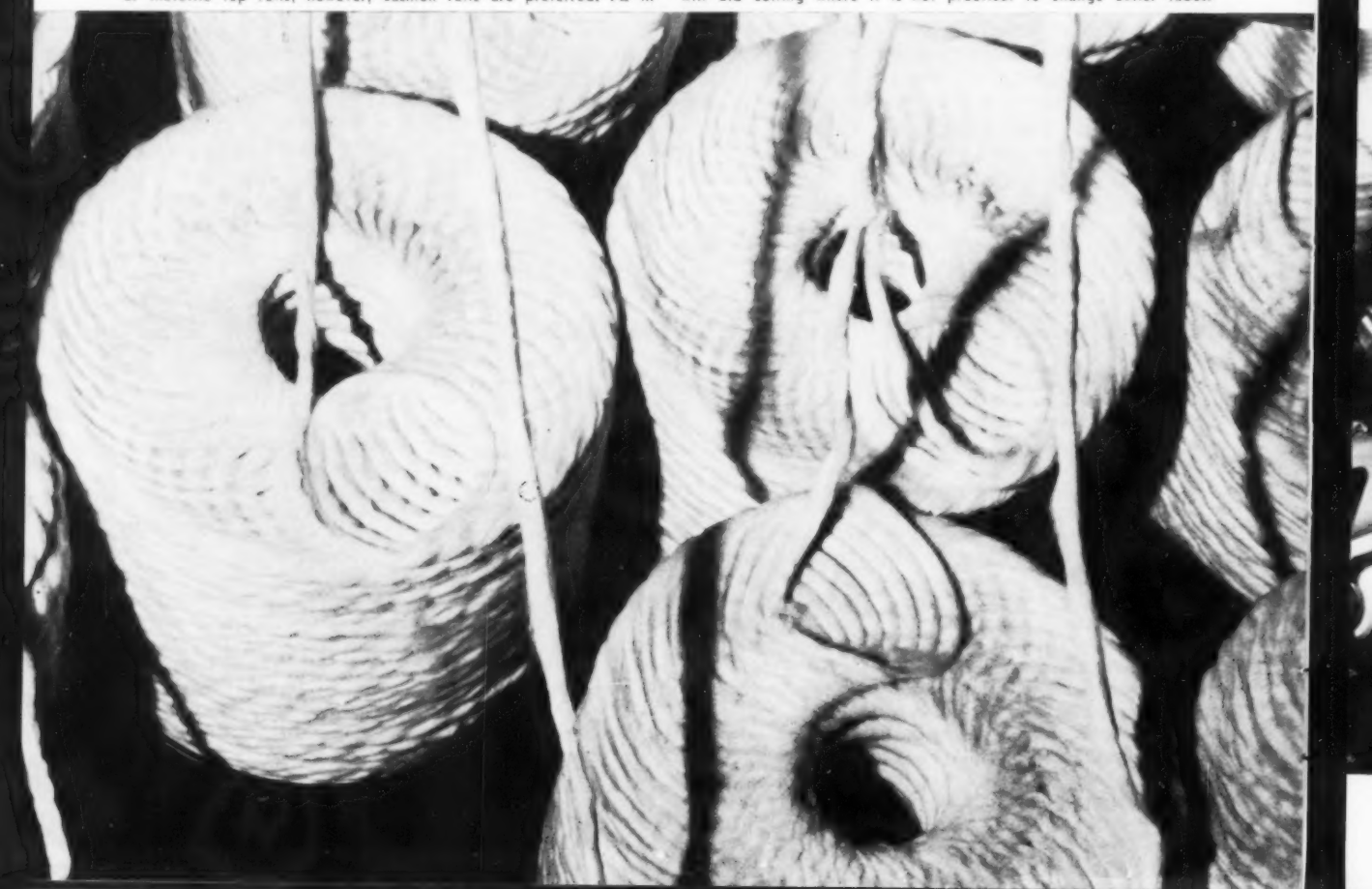
Feeding from several bales of the same product mix is desirable to assure uniformity in processing. Blends of Zefran with other fibers are made behind the picker in a sandwich blend or by standard blending machines.

Blends of Zefran with cotton are usually made on the drawing frame. Card sliver of Zefran should be drawn once before blending with combed cotton sliver on drawing. Successful blends have been made using from 65% to 80% 2d/f 1½" Zefran with 1⅛" to 1½" staple cotton. The exact blend is determined by the hand and properties of the fabric desired.

The differential in tension on drawing between the cotton and Zefran requires careful adjustment. Slightly closer roll settings than normal may be desirable to impart better control over the two fibers in the drafting zone.

The subsequent processes are

The drawing of slivers made of Zefran can be accomplished on any of the three-over-four or four-over-four drawing frames, with cushion or metallic top rolls; however, cushion rolls are preferred. As in carding, larger tube gears and trumpets are needed to produce slivers which weigh more than 50-55 grains per yard. Spring cans will aid coiling where it is not practical to change coiler tubes.



principally the same as for processing 100% Zefran or fibers of similar denier and staple lengths.

Finish Reapplication. Normally the addition of a finishing agent is not required, since a finish is applied to the fiber as supplied in the bale, which gives good drafting and static control. In raw stock dyeing, the original spin finish is removed and it is necessary to reapply a finish to give a desired balance of lubricity and cohesion for static electricity and drafting control.

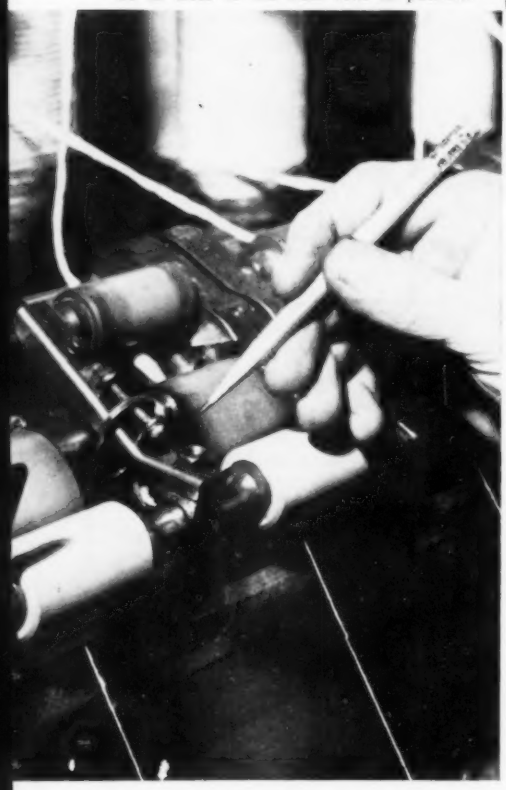
Avitex R[1] is recommended in final rinse after dyeing to impart needed lubricity. Antistatic agents are oversprayed to provide the necessary static control and cohesion. 0.5% to 1% Avitex R in the final rinse and 0.3% to .5% Nopco 2152P[2] sprayed on the dyed stock from a 10% aqueous solution

[1]Registered trademark of E. I. Du Pont de Nemours & Co.

[2]Registered trademark of Nopco Chemical Co.

To compensate for Zefran's bulkiness, there are several steps which should be taken to insure an even, well-formed lap. Suggested precautions include use of a split lap preventer.

In spinning Zefran on double-apron systems, it is recommended that the nip of the aprons be as close to the front rolls as possible.

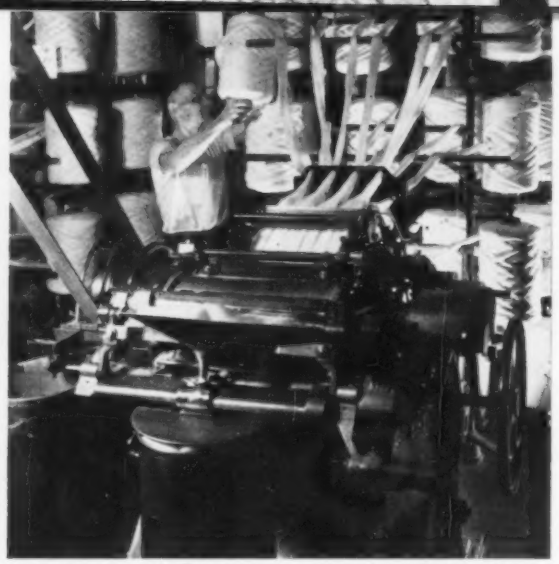


How to process ZEFRAN

The new acrylic fiber can be spun on the cotton or synthetic, worsted, and woolen systems of yarn manufacture under essentially the same conditions as other fibers of the same denier and staple length

by Harry N. Woessner and J. Robert Overby
Textile Development Engineers
Textile Fibers Department, The Dow Chemical Co.
Exclusive

Single-cylinder worsted cards are satisfactory for Zefran; however, double-cylinder cards are preferred for blends of 50% or more wool.



On the French comb, Zefran can be processed satisfactorily with 1.5 to 3.0 per cent noil. Two gillings after combing are recommended.

is suggested.

The depth of color and the condition of the stock after dyeing will govern the amount of finish reapplied. Overspraying is usually done behind the picker after the stock has been opened and blended on conventional opening equipment.

Tinting. Tinting for identification purposes requires care, due to the high affinity of Zefran for dyestuffs. Several suggested tints are given in *Table 1.*

These tints are normally removed by scouring in a 30 to 1 bath containing one to two per cent nonionic detergent (OWF) at 160 F for 30 minutes. Since scouring conditions and blends with other fibers vary widely, it is suggested that these tints be checked carefully by each mill under its own particular conditions.

Picking. A standard one or two process rayon or cotton picker with Kirschner beaters will provide satisfactory opening and a uniform lap with minimum adjustments. To compensate for the bulky nature of the fiber, the following steps should be taken to insure an even, well formed lap:

1. Beater speeds — 800 - 1000 rpm
2. Fan speeds — 900 - 1100 rpm
3. Dampers should be adjusted to blow majority of stock on upper screen.
4. Maximum calender roll pressure should be used to minimize lap splitting.
5. Pneumatic rack pressure of 26 psi is suggested for best lap unwinding.
6. A split lap preventer aids proper lap formation. Laps of 11 - 14 oz/yd and 30 - 35 yd in length are satisfactory for 100% Zefran. Longer laps are possible when blends of rayon or similar fibers are made. Settings of feed roll to beater should be 3/8" to 1/4"; however, when a fringe roll is used, the setting should be 1/8" to 3/16".

Carding. Zefran cards well at 75 to 80 F and 50 to 60% RH. It can be carded on flat or roller cards with essentially the same settings and speeds as cotton or rayon. A fancy is not needed when carding 100% Zefran in 2, 3, and 6 deniers.

The bulk of Zefran makes it necessary to use larger coiler tube gears and trumpets when producing slivers over 50-55 grains per yard. a coiler tube gear of 1½" diameter and a trumpet of 0.15" diameter hole gives good results on slivers over 55 grains per yard.

Card production up to 15 pounds per hour can be obtained. It is advisable to card finer yarn counts and fine deniers at 8 to 10 pounds per hour for best quality.

Drawing. The drawing process can be accomplished on any of the 3-over-4 or 4-over-4 roll drawing frames with cushion or metallic top rolls; however, cushion top rolls are preferred.

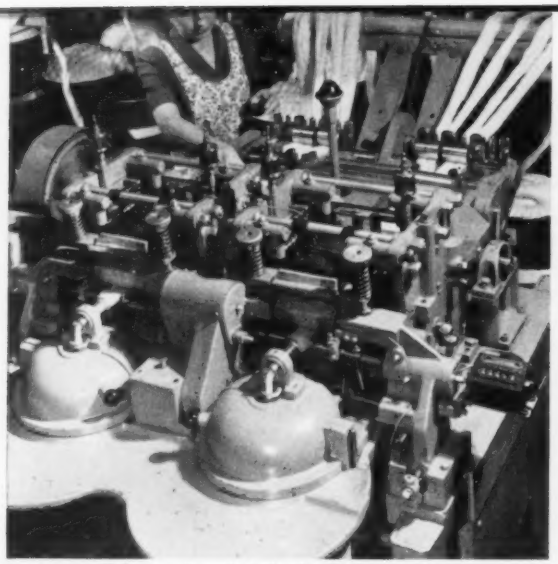
As in carding, larger tube gears and trumpets are needed to produce slivers over 50-55 grains per yard. Spring cans aid coiling where it is not practical to change coiler tubes.

The following roll settings have given good results on drawing:

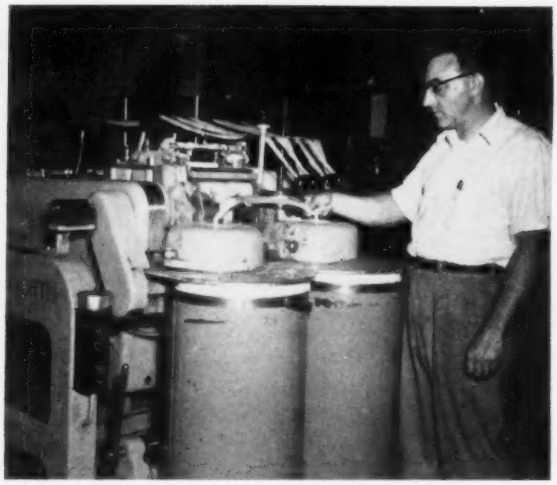
Rolls	Setting, Staple Length Plus
1st to 2nd	1/8"
2nd to 3rd	1/4"
3rd to 4th	1/2"

TABLE 1. Suggested Tints for Zefran

Dyestuff	C.I. or Pr. No.	Manufacturer	% on Weight of Fiber
Alphazurine A	CI 673	National Aniline	0.005
Brilliant Alizarine Light Violet FFR	.....	Sandoz	0.020
Neolan Orange GRE	Pr 463	Ciba	0.020
Tartrazine Ex Conc	CI 640	Geigy	0.015
Vitrolan Red BRE	Pr 509	Sandoz	0.020



In blending Zefran and wool at the Pin Drafters, it is recommended that the sliver weights of the two be as nearly equal as possible.



Recommended settings for processing Zefran on gill reducers are the same as normally used for other fibers of the same staple lengths.

Roving. Roving performance is very satisfactory on either long draft or conventional roving frames. Draft of 20 on long draft frames gives good results. Proportional draft organizations consistent with count produced are recommended.

The following roving twist multipliers are suggested for processing 100% Zefran:

Denier	Length	TM
2.0	1½"	0.85
2.0	2"	0.80
3.0	1½"	0.95
3.0	2"	0.90
3.0	2½"	0.85
6.0	2"	1.05
6.0	2½"	1.00
6.0	3"	0.90

Roving tension and lay should be carefully adjusted to allow for fiber bulk. The roll settings for roving are generally the same as for roving or other fibers of the same denier and staple length.

Suggested roll settings are as follows:

Rolls	Setting, Staple Length Plus
1st to 2nd	⅛"
2nd to 3rd	¼"

Spinning. Spinning of Zefran can be accomplished on standard long draft frames with drafts up to 24 on two-zone drafting systems and up to 18 on one-zone drafting systems. Breaking strengths are usually higher at the lower twist multipliers. Twist multipliers of 2.75 to 3.25 are recommended for knitting and filling yarns, and twist multipliers of 3.5 to 3.75 are generally preferred for warp yarns.

Roll settings for spinning Zefran are usually staple plus ⅛" between first and second rolls and staple plus ¼" between second to third rolls. On double apron systems, the nip of the apron should be as close to front rolls as possible.

The spinning limit of Zefran, as with all fibers, depends on the denier and staple used. At the top of the next column is a table of spin limits suggested for spinning yarns from Zefran.

Denier	Staple Length	Cotton Count
2.0	1½"	37/1
2.0	2"	40/1
3.0	1½"	25/1
3.0	2"	27/1
3.0	2½"	28/1
6.0	2"	12/1
6.0	2½"	14/1

Winding and Twisting. Winding and twisting operations can be accomplished on standard equipment. Low to moderate uniform tensions are desirable for best results.

Yarn liveliness can be controlled using standard twist setting equipment at 180 F dry bulb setting and 170 F wet bulb setting for one hour or less.

WORSTED SYSTEM PROCESSING

Zefran can be processed readily on Bradford, French, modified, and American worsted systems, using normal processing procedures associated with wool and other fibers. Zefran is available in two, three and six deniers, semidull and bright lusters, and in staple lengths of 3 and 4½".

Picking and Blending. As received, Zefran staple is in a semi-opened state and requires only a light picking operation prior to carding. The spin finish on Zefran has adequate lubricity and static control and normally does not require addition of finish. When Zefran is blended with wool at the picker, the wool oil emulsion should be applied to the wool before blending.

Stock dyed Zefran requires reapplication of a finish to obtain lubricity and static control. Approximately 0.5% Avitex R applied in the final rinse and 0.3% to 0.5% Nopco 2152P (OWF) applied by spraying from a 10% aqueous solution gives satisfactory processing results.

Carding. Single cylinder cards clothed with metallic wire and standard wired worsted cards will satisfactorily card Zefran. Two-, three-, and six-denier Zefran can be carded using settings normal for $60^s/64^s$ grade wool.

Sliver weights of 120 to 140 grains per yarn can be produced with good results. A double cylinder worsted card is preferred if

When oil emulsions are required for processing Zefran/wool blends on the woolen system, add the emulsion to the wool before blending.

Leather and neoprene-coated condenser tapes and leather and synthetic rub aprons are satisfactory for Zefran and Zefran/wool blends.

50% or more wool is used in the blend.

Normally the Zefran will be carded and combed and then blended with the wool at the gilling operation. Card sliver of 100% three-denier and coarser Zefran may be taken directly to the Pin Drafter. Normally three or four passes are sufficient for satisfactory yarn quality.

Progressively finer pinnings ranging from twelve to twenty-nine ppi give good results. Care should be taken that the pins are not overloaded, especially on the initial pass.

Nip roll settings from 0.188" to 0.030" are recommended for progressive Pin Drafter operations. Condenser settings as close as practical are suggested for best quality sliver.

Preparer Gilling and Combing. Zefran in 100% and in wool or synthetic fiber blends can be satisfactorily combed on Noble and French combs. One or two processes of preparer gilling are usually sufficient for undyed stock. When blending top-dyed Zefran with wool top for recombing, three preparer gillings are recommended.

On the Noble comb, a feed of 2500 grains/5 yards is satisfactory for a 50/50 or 60/40 wool blend to deliver 430 grains per 5 yards.

On the French comb, 12 ends of 140 gr/yd Zefran or Zefran and wool slivers can be processed satisfactorily with noil percentages of 1.5% to 3.0% on 100% Zefran.

Two gillings following combing with approximately 15 ppi will make a good quality finished top.

Blending dyed or undyed top of Zefran with dyed or undyed wool top is readily accomplished on conventional gill boxes or Pin Drafters, using 12 to 15 pins per inch. The sliver weights of the two fibers should be as nearly equal as possible and there should be the same number of slivers where the blends are approximately 50/50.

Since wool top has considerably more cohesion than dyed top made from Zefran, it is necessary to have adequate support for the sliver during initial blending, especially when two-denier 3" Zefran is used. A supporting sliver creel greatly assists in this operation.

Top-Dyed Zefran. Top-dyed Zefran should be treated with 0.5% to 1% Avitex R at 120 F in the last rinse after dyeing. Additional static control can be achieved by overspraying the top with a 25% solution of Nopco 2152P to give 0.3% OWF.

An application of 0.3 to 0.5% OWF Worsted No. 12 Oil in 100% concentration by the Accumeter spray at gilling directly after backwasher drying gives satisfactory processing.

Backwasher drying temperatures may be as high as 250 F; however, overdrying should be avoided.

Drawing. The drawing operations for Zefran and Zefran/wool blends can be accomplished on conventional weigh boxes or on Pin Drafters. Normally, when using Pin Drafters, three or four passes are sufficient for good quality yarns; however, the number of passes will be determined by the degree of blending and yarn effect desired.

Reducing. Zefran processes satisfactorily on reducers with settings normally used for other synthetics or wool of approximately the same staple lengths.

Roving. Conventional or high draft roving frames produce good results on 100% Zefran and Zefran/wool blends. Less twist should be used in roving of 100% Zefran and Zefran/wool blends than used on 100% wool.

Roll settings of ¼" to ¾" over the staple length normally produce even roving.

Spinning. Zefran has excellent spinnability on conventional and

high draft systems. Over-all settings of staple plus ¼" to ¾" will produce good quality yarns.

For soft bulky yarns, lower twist may be used without adversely affecting yarn strength. Worsted yarn numbers as high as 2/70^s can be made in 50/50 and 60/40 Zefran and wool blends.

Relative humidity of 50 to 60% and temperature between 75 and 85 F are suggested for best processing results.

Processing on the Pacific Converter. Preliminary evaluation of Zefran in tow form indicates that it can be processed readily on the Pacific Converter.

A curved bar type creel assists greatly in uniform, straight tow feeding. Slight adjustments may be needed in the shuffle section to allow for the bulk of the Zefran.

A tow feed of 1.3 to 2 million total denier with a draft of 20 gives good results in delivering a sliver of 130 to 200 gr/yd. Converter sliver is usually combed before subsequent processing into yarn on the American system.

TABLE 2. Clothing and Settings for Fine Count Zefran/Wool Blends

	Breaker	Intermediate	Finisher
Cylinder Clothing	No. 33 wire	No. 34 wire	No. 35 wire
Workers to Strippers	26 gauge	28 gauge	30 gauge
Workers to Cylinder	26 gauge	28 gauge	30 gauge
Strippers to Cylinder	26 gauge	28 gauge	30 gauge

WOOLEN SYSTEM PROCESSING

Two-, three-, and six-denier semidull and bright Zefran in staple lengths of 1½", 2", and 2½" can be processed readily on woolen equipment utilizing normal adjustments and settings.

The lubricity and static control associated with the normal spin finish of Zefran are, in most cases, adequate for woolen system processing. In some cases where coarse denier blends of 100% Zefran nad blends of Zefran and wool are desired, it is advisable to add an emulsion for better condensing.

Opening and Blending. Zefran requires only a light to moderate opening prior to carding. Excessive opening may result in weigh pan variation and inability to obtain a heavy feed for coarse roping. When oil emulsions are required on Zefran and wool blends, the emulsion should be applied to the wool before fiber blending.

The floor sandwich method for initial blending is satisfactory. Good blending and opening can be accomplished on mixing and Fearnaught type pickers.

When desirable, the Zefran and wool can be oiled together during blending; however, it is suggested that the oil content not exceed 2%.

Dyed Raw Stock Procedure. Zefran does not generally require additional finish or emulsion; however, on stock-dyed Zefran a reapplied finish is required. 0.5% Avitex R in the last rinse after dyeing with an overspray of 0.3 to 0.5% Nopco 2152P from a 10% water solution is recommended.

If blending with wool follows dyeing, Nopco 2152P may be omitted and the blend may be sprayed with one of the following wool oils:

Mobiloil 1500[3], 5 to 6 parts water, 1 part oil—5 quarts per 100 pounds stock.

Proxol T[4], 5 to 6 parts water, 1 part oil — 5 quarts per 100 pounds of stock.

Worsted Oil No. 12[5], 5 to 6 parts water, 1 part oil—5 quarts per 100 pounds of stock.

The above recommendations are starting points and amounts of emulsion will vary with blend levels, stock conditions (dyed and undyed), mill conditions, and methods. Generally 0.5 to 2 (OWF) oil percentages on 100% Zefran give good results, while on wool blends the oil content may be increased.

It is desirable to allow the stock to "age" for 8 to 24 hours before further processing after applying the oil emulsion.

Carding. Two and three cylinder woolen card sets can be satisfactorily used for carding Zefran and Zefran/wool blends. Metallic and flexible wire with normal fine grade wool settings give good results. Fillet wire is preferred for making roping for fine count woolen yarn.

Lighter pan dumps with increased feed promote more efficient carding and more even roping. The wire clothing and gauge settings suggested for making fine count Zefran and wool blend yarns are given in *Table 2.*

Tape condenser rub aprons should be set to 28 gauge with about ½ inch stroke and an eccentric action of approximately 290 strokes per minute; as the staple length increases, less rubbing is required.

Leather and neoprene - coated tapes and leather and synthetic rub aprons give good results. The suggested settings will vary slightly with mill conditions, equipment, and stock.

Spinning. High quality yarns of Zefran and Zefran/wool in counts as high as 10 run can be successfully processed on woolen spinning frames with drafts from 1.25 to 1.40. The settings and drafts will vary with the staple length and blend of fibers to be spun.

Temperature and Humidity. Best quality for yarns of Zefran is obtained on the woolen system with relative humidities of 55 to 60% and temperatures of 75 to 80 F.

Twist Setting. In some instances, it is desirable to condition yarns of 100% Zefran and Zefran/wool to reduce liveliness. The conditioning should be done under controlled moisture and temperature for the minimum time required to obtain adequate yarn control.

Conditioning at 180 F dry bulb and 175 F wet bulb for 20 minutes to one hour is suggested.

[3]Registered trademark of Socony Vacuum Oil Co.
[4]Registered trademark of Proctor and Gamble Co.
[5]Registered trademark of Textile Aniline & Chemical Co.

rayon staple manufacture gets automated

Exclusive

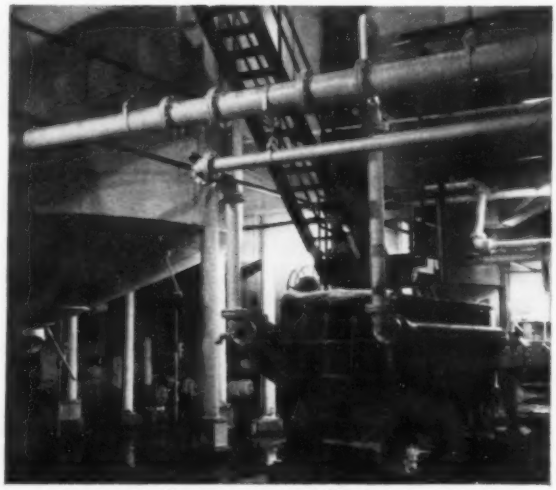
Mechanical handling of wood pulp

ANYONE who has not been in a rayon staple plant for several years will find that there have been some changes made—and big changes, too—if he visits one of the plants built since the war.

Gone are the wet, slippery floors and obnoxious fumes associated with the older rayon plants, and in their place are surroundings close to those enjoyed by most white-collar workers.

Representative of the best of the newer conditions is the LeMoyne, Ala., plant of Courtaulds (Alabama) Inc., which went into production late in 1952. In this plant rayon staple is manufactured for the first time in the United States using the automation techniques which have been playing such an important part in the development of other industries.

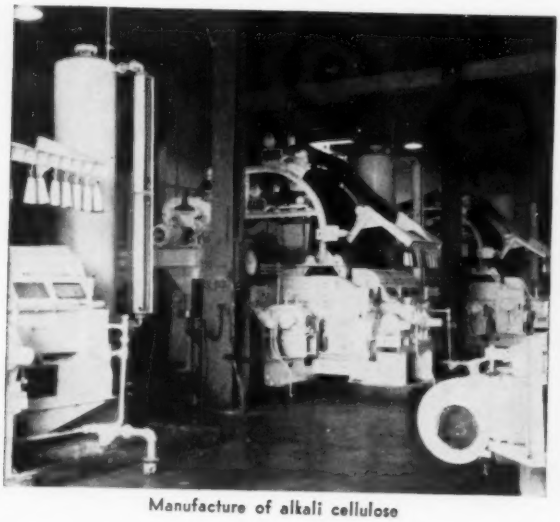
The photographs on these two pages show Courtaulds' facilities for producing Fibro and Coloray rayon staple.



Viscose storage and filtration

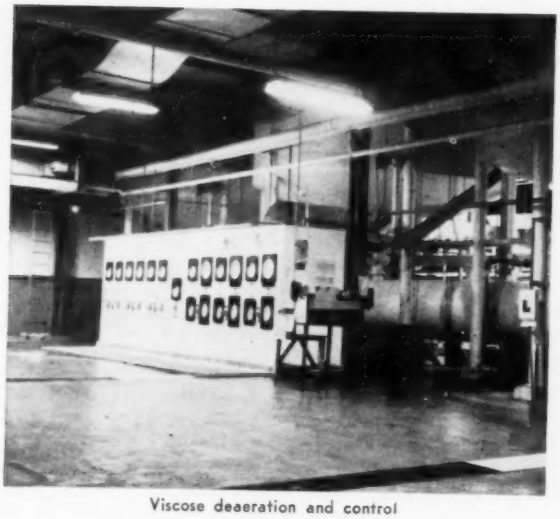
Textile research and development building

Section of the modern drying facilities

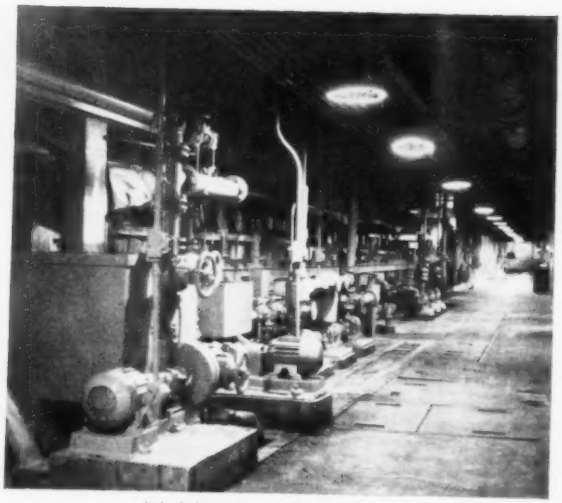


Manufacture of alkali cellulose

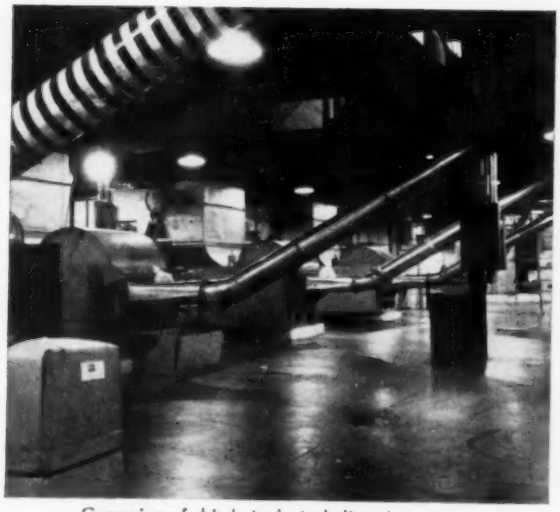
Central control equipment for xanthation process



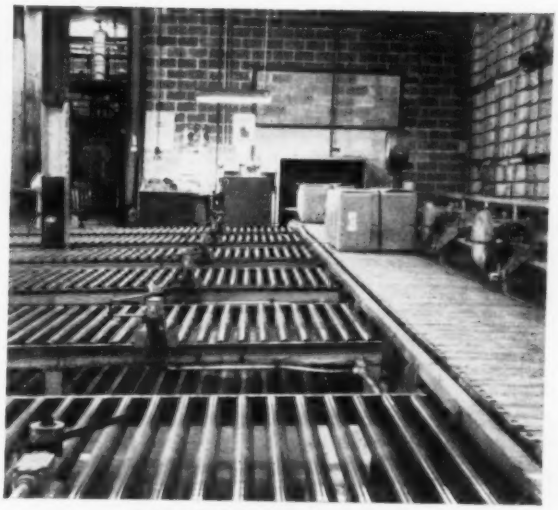
Viscose deaeration and control



Wash liquor pumping installation



Conveying of dried staple to baling department



Automatic bale transfer equipment

The case for RAYON TIRE CORD

Exclusive*

THE OUTSTANDING performance record of today's tires is eloquent proof of the sustained and successful efforts of the tire companies to build higher levels of value into their products. It is, in effect too, a reflection of the continuing and productive research of the rayon industry which helped to open a new era of safe and carefree driving when it began to supply tire cord to the tire industry.

The initial impact of rayon on the tire manufacturing industry occurred during World War II, when military tests of all tire cords clearly established that rayon was best suited to withstand the punishment imposed by heavy motorized equipment. As a consequence, rayon tire cord was given a top priority and rayon companies moved quickly to convert their facilities for its production. Ever since then, the rayon industry has served as the preferred and major supplier of cord to the tire industry.

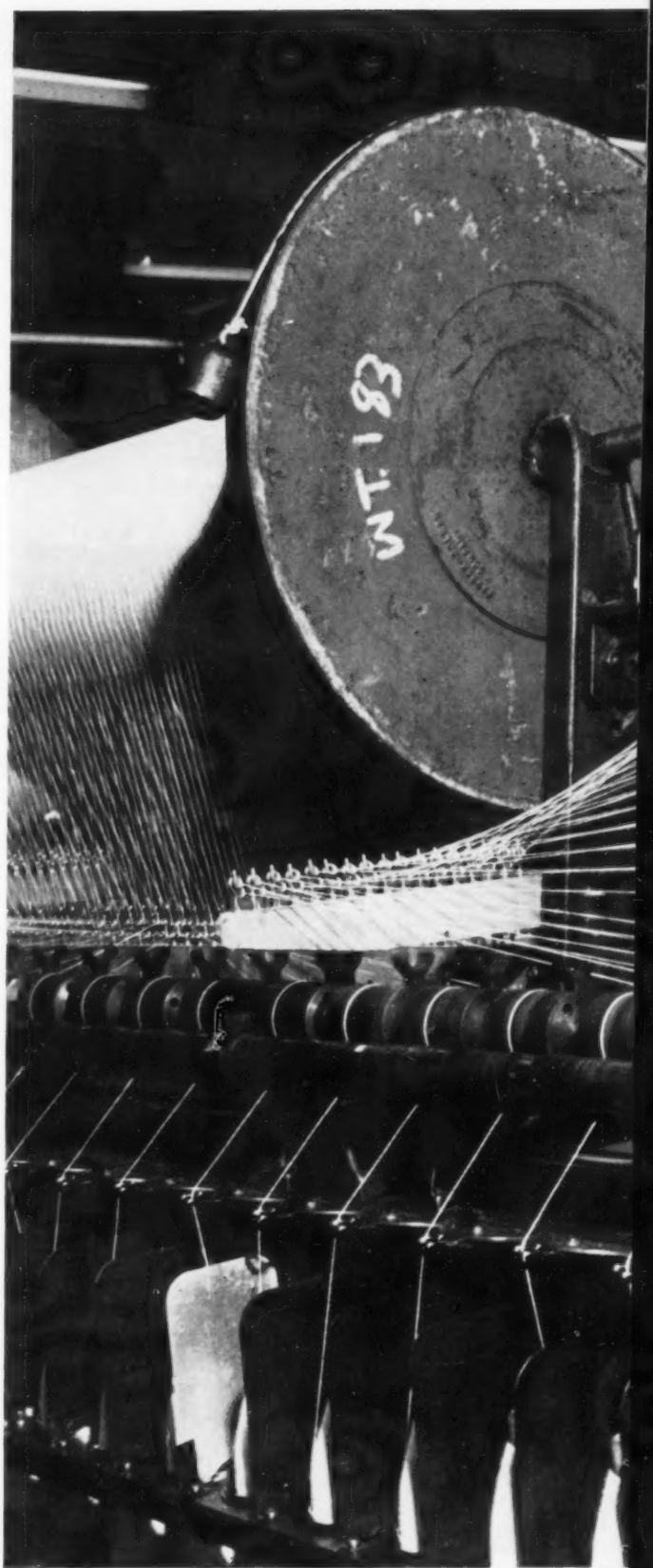
The improvements in the performance characteristics of rayon tire cord, especially in recent years, rival the acclaim with which rayon was first introduced and today a tire blowout is almost as rare a sight on the highway as a Model T.

During the last five years alone, the conditioned tensile strength of rayon tire cord has been increased 50 per cent, its wet strength has been improved by 90 per cent, and its fatigue resistance has been increased 500 per cent.

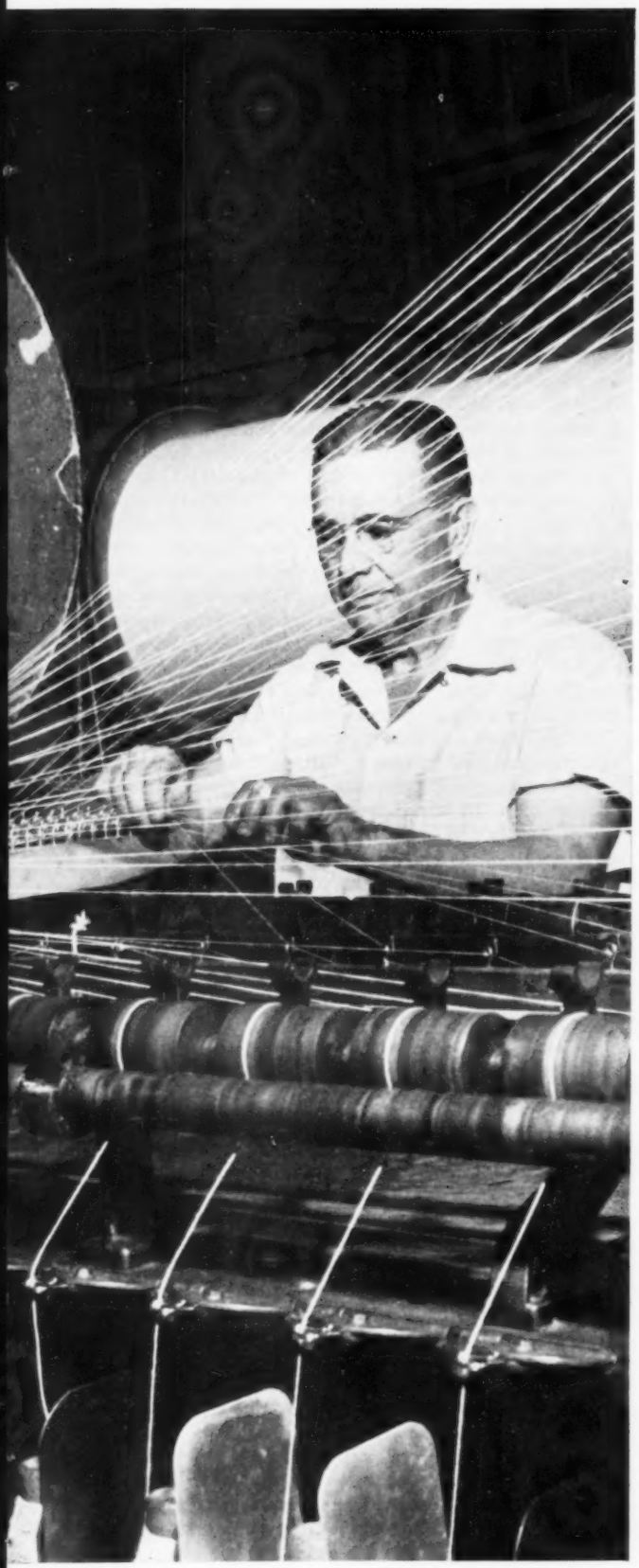
These continued improvements in rayon tire cord were recently capped by the introduction of a "super-super" rayon. This new rayon has been acknowledged as the most important single step forward in the development of a superior tire cord and has served to enhance rayon's preeminent position in the tire industry. The enthusiastic response which accompanied the introduction of this new rayon tire cord is founded on a series of intensive laboratory and road tests by rayon companies, the American Rayon Institute, independent testing agencies, and major tire manufacturers.

ONE OF THE more important benchmarks of the value of a tire is, of course, the amount of safe mileage it will provide. Comparative testing of rayon and nylon cord tires revealed that rayon cord tires can be expected to give as much as 26 per cent more original mileage than nylon cord tires. In one test in which cars were run 24 hours a day for five weeks over a 225-mile course and on all types of roads, the tread of the nylon tires was worn smooth after 24,750

(Continued on page 97)



*Prepared by the American Rayon Institute.



The case for NYLON TIRE CORD

Exclusive*

THE HISTORY of the tire cord field provides a dramatic example of American industry's constant search for better materials and improved technology. Each forward step—from cotton duck to cotton cord to rayon cord and, finally, to nylon cord—has represented a contribution to the motoring public resulting from considerable investment in research, development, and production equipment.

Nylon cord was first adopted during the war years. Introduced with a tenacity of six grams per denier, nylon was able to meet performance demands imposed by landing speeds and gross weights of military aircraft beyond the capabilities of rayon, the tenacity of which has only recently been improved to five grams per denier.

At the war's end, nylon's performance potential was quickly drawn upon for off-the-road and heavy duty truck tires. As technology has improved, nylon has been adopted increasingly in lighter tire constructions. At present, it is used in essentially 100 per cent of all airplane, off-the-road, heavy truck replacement, and premium passenger tires.

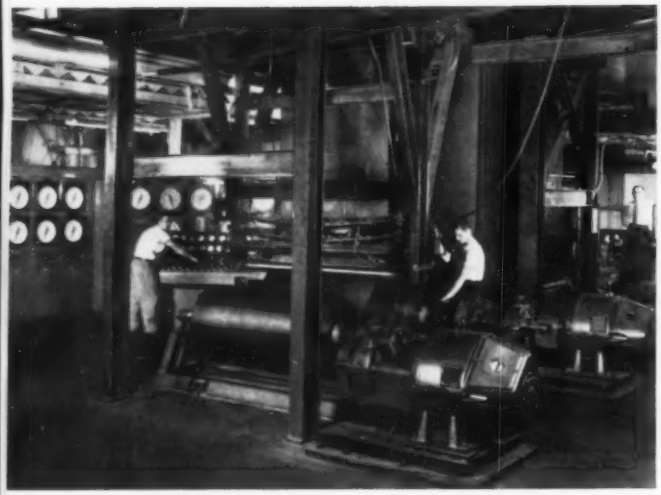
In addition, nylon is used in 30 per cent of original equipment truck tires, medium duty truck replacement tires, and first line passenger replacement tires, and 20 per cent of second and third line passenger tires. In original equipment applications, 12 out of 18 makes of autos offer nylon tires as an extra cost option on their 1958 models.

It is interesting to note that, in terms of pounds of rayon replaced, the growth curve for nylon closely parallels that for rayon during its market penetration in the war emergency. In 1957, tire companies bought approximately 87,000,000 pounds of nylon for tires. To meet the needs of the entire market, about 275,000,000 pounds of nylon would have been required. On this basis, nylon now holds about 32 per cent of the total market.

This progress has resulted from work by fiber producers and tire manufacturers alike. From the point of view of fiber properties, nylon's tenacity has been increased to nine grams per denier. Concurrently, tire manufacturers have made large investments in hot stretching and other processing equipment to take full advantage of nylon's properties both in performance and economics.

The basis for this confidence in nylon's future lies in the properties of the fiber itself, as demonstrated in the laboratory and, more importantly, on the highway. *(Continued on page 96)*

*Prepared by Textile Fibers Department, E. I. du Pont de Nemours & Co. (Inc.).



Nylon Tire Cord *(from page 95)*

IN THE LABORATORY, a multitude of tests has established that nylon has outstanding advantages in the properties required for safer, longer lasting tires.

Bruise resistance tests require multiple impacts to determine any valid differential in performance. In a series of tests in which a three and seven-eighths inch long plunger smashes into a tire at 170 blows per minute, or once each revolution at 35 miles per hour, commercial 7.50-14 nylon tires averaged 650,000 impacts before failing as opposed to 50,000 impacts for their rayon counterpart.

Even more significant were impact tests done on tires previously run 24,500 miles in standard taxicab service. Rayon tires after 24,500 miles of service averaged only 7,800 impacts to failure, while the nylon tires at the end of 24,500 miles of service stood up to 204,000 impacts. Thus it is clear that the nylon tire gains in its superiority over the rayon tire with use.

In testing for toughness, determined by ability of a tire to resist puncture by a plunger one and one-fourth inches in diameter, it required 22,750 inch pounds to rupture commercial nylon tires, 7,700 inch pounds to rupture rayon tires. And in tests on a Bureau of Standards high speed test wheel, 7.50-14 nylon tires withstood speeds some 10 miles per hour faster than rayon tires made by the same tire company.

Heat testing performed with cured-in-rubber cord to duplicate as accurately as possible the condition of the cord in a tire showed that nylon exposed to 212 F for 30 days lost 27 per cent of its strength, while rayon of the type identified as "super super" rayon lost 70 per cent of its strength. At 300 F, strength loss was 28 per cent for nylon in 72 hours, and 67 per cent for rayon. Normal road operating temperatures in summer months, it should be noted, may cause tire temperatures to go as high as 270 F.

Also of importance to tire performance are the contractile forces in nylon tire cord induced by heat. These forces tend to offset the effects of centrifugal force at higher speeds, reducing distortion of the tire and consequent stress on the rubber, and maintaining a larger percentage of the normal tread contact with the road surface.

In yet another property readily demonstrable in the laboratory, nylon shows markedly greater resistance to effects of moisture, which may seep into a tire through small cuts or cracks. When exposed to moisture, nylon retains 87 per cent of its dry strength, while "super super" rayon retains only 55 per cent. In addition, nylon is not weakened by the long-term effects of mildew or rot induced by moisture, while rayon is destroyed rapidly.

LABORATORY TESTS, however, are only guide posts on the route to determining superior tire performance. No laboratory test can duplicate the forces in effect on the road. For definitive answers, long-term highway tests are required.

In four commercial taxicab fleet tests, totaling some 8,000,000 tire miles, 204 nylon tires from three major tire companies averaged 21,700 miles on the original tread while 264 rayon tires from the same manufacturers averaged 21,000 miles. While original tread mileage did not differ significantly, resistance to road impacts did. Twenty-five of the rayon cord tires failed on the original tread because of impact breaks of the type that cause blowouts, while only one nylon cord tire failed for this cause.

In taxicab fleet testing carried to the point where all rayon tires had failed, it was found that the rayon cord tires had averaged 2.1 retreads for total average mileage of 41,500 miles per tire. Meanwhile, 70 per cent of the nylon cord tires were still in service, on the sixth retread, giving preliminary averages of 4.3 retreads and 74,500 miles per tire. Impact failures had accounted for 64 per cent of rayon cord tire failures and only seven per cent for nylon cord tires through the fifth retread period, a dramatic demonstration not only of safety but also of long-term economy for truck and passenger fleet operators.

At all speeds of operation, as the result of thinner, more flexible, yet tough, side walls, nylon cord tires exhibit a 10 to 15 per cent softer spring rate than rayon. In addition, the lower weight of the nylon cord tire presents a lighter unsprung mass than does a rayon tire.

Also, believed due to the lighter side wall, tests have consistently shown that nylon cord tires generate less heat than do rayon tires.

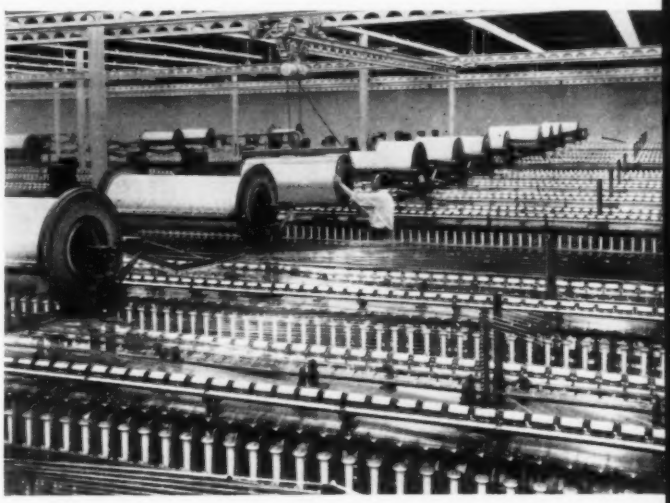
In all properties tested, nylon cord has proven to offer superior resistance to the normal road hazards of impact, heat, flexing, and moisture, an extra margin of safety increasingly called for in an era of heavier, more powerful automobiles and turnpike driving at high sustained speeds and tire temperatures.

It is significant to note that property improvements have been accompanied by reductions in the cost of building nylon cord tires, to the point that nylon is now offered in second line tires for trucks and passenger cars. Post inflation, one of the recent advances in the tire technology which has made this

possible, has proven effective in controlling growth, an early problem in nylon cord tires. With growth under control, further reductions in the cost of building nylon cord tires can be anticipated, along with further improvements in cord properties.

As the tire industry continues to capitalize on the superior properties of nylon, the consumer's awareness of nylon's contribution to better tires will increase and nylon's steady progress in the tire market can be expected to continue.

Rayon Tire Cord *(from page 94)*



miles. The rayon tires still had safe and dependable tread life after 31,275 miles.

In addition to their greater original tread mileage, rayon cord tires are capable of giving more mileage per retread. One test for retreadability showed severe damage to the nylon tire after three retreads and 36,993 miles. Comparably constructed rayon cord tires had considerably less impairment after 47,260 miles. In order to accelerate this test, all tires—rayon and nylon—were retreaded after the first 15,000 miles at which point only two tires had failed—both of nylon cord construction.

In other retreadability tests over a predetermined course, rayon cord tires went the distance on three retreads while the nylon tires required four retreads to cover the same distance.

The research efforts of the rayon industry and the tire manufacturers have been equally concerned with improvements in the safety of rayon tires as they have been with affording increased mileage. And in this area, the results have been comparably significant.

Rayon cord tires' unsurpassed resistance to impacts was reported by an independent testing agency which conducted tests involving 25 rayon and nylon tires—all of four-ply construction, size 7.50 x 14—built by two leading tire manufacturers.

In this impact test, the tires, heated to scorching temperatures through road runs and tight-circle turns, were slammed into a six-inch granite curbstone at speeds of 20, 40 and 60 miles per hour. At 40 and 60 mph, the sharp edge of the granite slab bent the tire rims but the cords of both types of tires were undamaged. The test tires in all of these tests were mounted on the front wheels of the car. An interesting sidelight to the test was the fact that rayon cord tires with more than 14,000 miles of wear were mounted on the rear wheels and that these tires withstood the same impacts as the new nylon cord tires.

This actual road-test of impact resistance, the testing agency reported, showed "no superiority of nylon cord to resist damage compared to the same tires using rayon cord."

Although rayon and nylon tires both withstood the severe road tests for impact resistance, laboratory impact tests clearly indicated that at high speeds rayon is the tougher of the two cords.

THE ABILITY of a tire cord to resist the effects of heat generated by steady driving is another important performance characteristic of the cord. High temperatures will cause a certain loss of strength in both rayon and nylon cords. However, laboratory and field tests conducted by independent research organizations support rayon's long-held superiority in resistance to heat. At tire temperatures of 240 F, reached under normal driving conditions, rayon cord kept 84 per cent of its strength while nylon cord fell to 65 per cent of its original strength. At temperatures of 500 F in the laboratory, the rayon cord retained half its original strength while the nylon cord failed completely.

The ability of rayon to maintain a higher strength at temperatures created at high speeds is in part responsible for the significant fact that almost all of the world land speed records have been established on rayon cord tires.

Rayon cord tires also provide a much quieter and more comfortable ride. Sensitive recording equipment installed in cars by an independent acoustical testing agency showed that rayon tires run as much as 33 per cent quieter than nylon tires at speeds up to 60 mph. Perhaps even more important is the fact that rayon tires do not develop "flat spots" while standing still which cause a thumping noise when the car is started—a characteristic which is reported associated with nylon tires.

While laboratory and field tests provide certain measures of appraisal for a product, the best and most conclusive test is the product's acceptability based on its proven record of service. Few, if any, products enjoy the testimonial of acceptability to the extent of rayon cord tires. The automobile industry this year, as in past years, has selected rayon cord tires as original equipment almost to the exclusion of any other tire. Today, more than 99 per cent of all new cars are equipped with rayon cord tires.

styling with the man-made fibers

They offer new opportunities but multiply the designer's problems

by Stanley Prokuski
Stonecutter Mills Corp.

Exclusive

IN THE ERA when the natural fibers dominated, the fabric industry was very closely defined. Cotton fabrics were manufactured in cotton mills while silk and wool were each woven in plants especially set up for the individual fiber. Very little trespassing was practiced and only on rare occasions was it necessary to use fibers alien to the basic setup. For the most part, this was done for decorative purposes, price considerations, or catering to a specific market.

Man-made fibers, at the onset, were really attempts at creation of an artificial silk. Viscose, acetate, and cuprammonium were generally called "artificial silks" for a number of years. As such, these man-made fibers did not fare too well and their adoption was slow, sometimes spasmodic. It was only when the attempt to emulate the silk fiber was divorced from the original three creations of the test tube that the rayon industry began growing.

Not only is the foregoing true but it is also an illusion that these or any of the subsequent new fibers created by man is an "artificial" cotton, wool, or linen. However, let it be clearly understood, this is not a denial that certain qualities akin to some of the qualities characteristic of the natural fibers can be achieved by proper use of the synthetics. Singular characteristics are imparted that do give the new fabric a look, feel, or performance of cotton, linen, wool, or silk in some respects.

As a matter of fact, the synthetic fibers can well be utilized to produce qualities of all natural fibers combined in one fabric. The great versatility of the man-made fibers can be employed by the stylist in innumerable ways, and the creation of fabrics is restricted only by the limitations of machinery or the human element.

Filament Rayon and Acetate. Starting with the first of the man-made textiles to appear on the scene, filament rayon, it seemed logical to use these yarns as silk replacements. Millions of yards of flat goods such as twills, taffetas, satins, voiles, and crepes were produced for linings and dress goods.

The designer who was familiar with the handling of silk had an advantage over the one whose experience had been confined to cotton or wool, but the wide variety of denier and filament sizes as well as lusters and inherent sensitivity to moisture changes presented him with new problems. The behavior of these yarns in quilling, warping, and weaving, and a need for new techniques in slashing called for unusual skill to produce first quality merchandise.

To imitate a silk construction, the designer had to make allowances for the swelling and shrinking of rayon during wet finishing. He had to make greater reed width allowances with proportionately lower reed sleys so that the finished cloth would resemble the silk fabric in hand and weight.

In order to minimize the abrasion of the individually finer filaments during weaving, he found it necessary to use coarser reeds. Lubrication of yarns during slashing and loomsetting finesse had to be employed to prevent barré or reedy goods.

When voiles, chiffons, and crepes were made, denier for denier the rayon required less twist per inch to attain results comparable with silk. However, because of the basic differences between rayon and silk, new constructions were devised for the basic silk fabrics, which became staples as time passed.

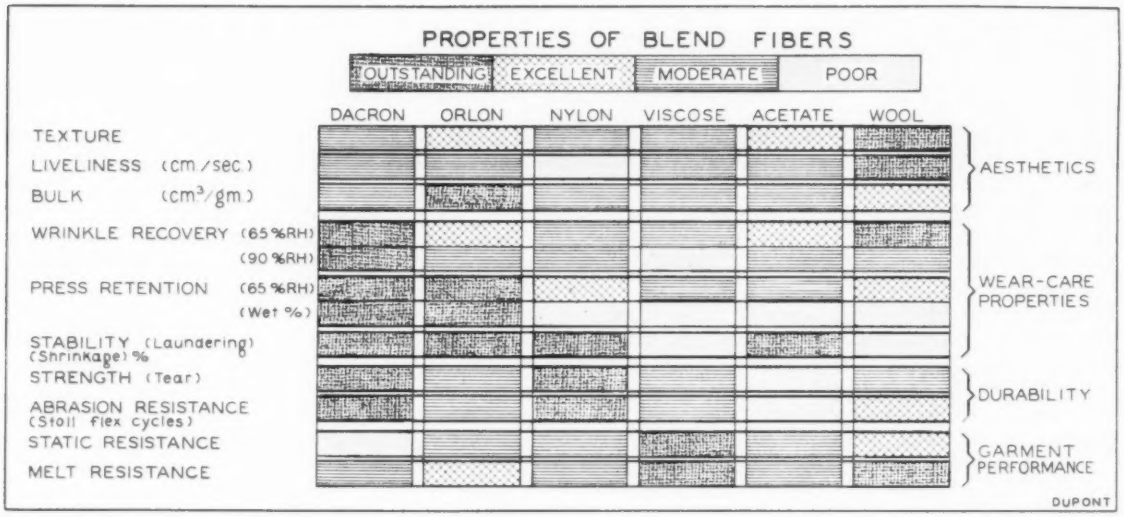
In constructing 100% filament acetate fabrics, the trend was to follow the rayon filaments in many ways. However, because acetate is a softer and more supple fiber it supplanted rayon in many of the basics, such as taffetas and satins used primarily as dress goods. In doing this, reed widths had to be revised downward and finer reeds used as compensation for the lower shrinking character of acetate.

New slashing compounds or modifications of existing rayon formulations were required to offset the lower moisture regain and harder-to-penetrate character of the acetate yarn. More concentrated solutions of size are required, while the control of heat in the size box or on the slasher cylinders must be rigid if the acetate is to maintain its strength and suppleness, and broken filaments due to yarn sticking or plasticizing are to be prevented.

Rayon and Acetate Staple. With the introduction of rayon and acetate staples, the fabric designer again came up against heretofore unknown fiber properties and principles. Particularly in the early days, strength limitations and filament size imposed restrictions on the fineness of yarn counts that could be spun.

In due time, equipment and skill were developed to permit the processing on the cotton system of staple lengths far in excess of those available in raw cotton. Today, of course, high tenacity rayon staple and very fine filament deniers permit increased spinning limits. Direct spinning from tow provides even greater versatility.

Much can be said on the subject of shrinkage alone—a problem practically nonexistent when



working with cotton. If a particular type of unshrunk filament rayon is used, allowances must be made in constructing cloth. Similarly, the unique high-shrinking property of direct-spun yarns enables the designer to fabricate a cloth which, when finished, possesses a warp density far beyond what is normally possible to attain with the natural fibers, while the strength, drape, and sewability are exceptional.

Nylon and Dacron. The unique shrinkage behavior of unrelaxed nylon has furnished another tool which affords an opportunity to create novel fabrics previously obtainable only through multiple beams, high yarn twist, controlled differential loom let-off or take-up, or chemical finishing methods.

Nylon puckers, for example, which became a tremendous volume item a few years ago, relied on the use of so-called relaxed and unrelaxed nylon during weaving or the use of unrelaxed nylon with a yarn of lower shrinking ability. Here, again, it is necessary for the designer to be thoroughly familiar with technical details which were relatively unimportant, and certainly less complicated in the days when only the natural fibers had to be considered.

In styling fabrics of all nylon, the designer must be conscious of the changes effected by heat setting, another phenomenon unknown before the advent of synthetics.

Dacron polyester yarns, too, have high shrinking qualities, similar to nylon, and are generally heat-set in finishing. The chemical techniques which may be used in finishing Dacron fabrics to made them lighter in weight and to impart a more silk-like hand is also something with which the well-informed designer should be familiar.

The relatively new textured, bulked, lofted, and stretch filament yarns are entirely unlike anything which was heretofore available and the technician responsible for laying out weaves or creating new styles must be aware of how each type of such yarn differs in its properties and behavior in weaving or knitting and dyeing and finishing if he is to do more than a hit-or-miss job.

Synthetic Staple Fibers. In the field of synthetic staple fibers, it is essential that one be familiar with more than just general principles pertaining to the effect of denier size or spun yarn twists.

Consider the variety of acrylic and acrylic-type staples alone: While there is certain similarity in the characteristics of a number of them, others behave quite differently. For example, the moisture regain of Eastman's Verel is higher than that of Orlon and Acrilan. The whiteness of some acrylics is greater than that of others, while the handle or softness is another property in which definite differences exist. The efficient stylist, therefore, must familiarize himself with these variations and plan his yarns and fabrics accordingly.

The matter of pilling of certain spun synthetic fibers is again something new to those experienced with cotton or rayon only and it is imperative that every precaution be taken to use proper fiber blends, staple lengths, and twists to minimize the appearance of this fault in the finished fabric or after relatively short periods of garment wear.

On the other hand, one cannot arbitrarily alter these factors without keeping in mind that he may end up with a yarn that is unspinnable or not weavable, or with a fabric that has a poor and unmerchantable hand, unsuited for any end-use.

Although stock dyed cotton and wool were well-known to fabric manufacturers long before the advent of the spun or solution-dyed man-made staples and filament yarns, the latter are available in a specific range of colors only. This requires ingenuity on the part of the stylist to blend the available colors (in the case of staple fibers) to achieve the shade or novel effects he is trying to get.

On the other hand, the mill is faced with an unending task of cleaning, segregation, and follow-through if contamination of colors is to be avoided.

Effect of Wet Processing. Dyeing and finishing are operations without which the woven or knitted

fabrics are of little value. One exception, of course, is the "loom-finish" type of woven fabric. A cloth of this class which has been popular as a dress fabric is the solution-dyed acetate taffeta. In this case a knowledge of exactly how the so-called "permanent"-type warp sizing will affect the hand of the woven cloth is needed as a guide in laying out the fabric construction.

Apart from the possible steaming or framing operation to remove wrinkles and creases, there is no finishing process to be relied upon to close up or shrink the woven fabric. In addition to taffetas, many linings, satins, and drapery fabrics are now used directly off the loom.

In dealing with 100% cotton, the long established desizing, singeing, boiling-off, and bleaching procedures were of no great concern to the stylist. However, he must now realize the limitations imposed upon the wet operations by their effect on certain of the man-made fibers. For example, he may not be able to rely on a chlorine bleach to get a good white, or mercerization or compressive shrinkage treatment to yield certain effects.

He may find that singeing of some synthetics results in a fusing and hard bead formation, objectionable in its effect on hand or resulting in a specky dyed appearance. Although dimensional stability is readily attainable in spun rayon fabrics, one must be aware of the fact that the chemical treatment required may add appreciably to the weight of the fabric and may alter the hand, surface appearance, or serviceability.

The dyeing differences among the various fibers may be an asset where cross-dyeing or multicolor effects are wanted. Or they may prove to be a tragic handicap if the blends which the stylist has created cannot be identified individually, or handled efficiently in manufacturing, or cannot be dyed in a practical manner except in certain shades or with limited color fastness.

Blends. The stylist is now confronted with the need for practical experience in determining the minimum percentages of specific man-made fibers required to contribute the desirable properties of those fibers—such properties as abrasion resistance, quick drying, or pleat and crease retention. He must be well versed, too, in the influence of the varying denier sizes and staple lengths on hand and yarn strength.

The introduction of so-called "high-bulk" or differential shrinkage acrylic fibers calls for an additional know-how on the part of the stylist if he is to use the new tools efficiently. The lower density, too, of some of the newer synthetics imposes further restrictions in the designing of fabrics and many an able technician has run into difficulty in "over-constructing" fabrics of these fibers, either because he did not know or would not accept the advice of the fiber manufacturer who was already aware of the effect on the finished cloth.

In addition to utilizing man-made fibers with different dyestuff affinities for cross-dye effects, the stylist can introduce patterns in warp and/or filling by combining bright and dull filament yarns, whereas previously he was dependent on producing similar effects in stripes or checks by combining "S" or "Z" twist yarns. On the other hand, the combinations of filament with the spun synthetics of the same types will produce fabrics with cord effects or repps and bengaline fabrics.

The utilization of filament warps with spun fillings or vice versa affords to the stylist possibilities of texture, surface interest, hand, and serviceability not too much unlike that of silk in combination with spun yarns of any of the natural fibers. There is no reason, of course, why the man-mades cannot be used in combination with the naturals, and as a matter of fact many pleasing and worthwhile fabrics are so constructed.

Fibers and yarns of similar basic composition, such as the acrylics and the nylons may exhibit distinct dyeing differences. Today two types of Chemstrand's Acrilan staple are being marketed which can be combined to give two-tone effects. Also, the nylon Type 6 staple or filament yarn made by Allied, Industrial Rayon, or American Enka exhibits greater dyestuff affinity than the conventional Type 66 manufactured by Du Pont and Chemstrand. Novelty effects resulting from planning constructions containing both types of nylon may be further enhanced by the addition of a third fiber with a different affinity for dyestuff.

In running spun blends of wool with some of the man-made fibers, as for example, Orlon or Acrilan, the stylist must be alert to the fact, if the fabrics are of the woolen type, that the chemical fibers do not full in finishing. They do, in fact, retard the felting and have at times been used to accomplish the prevention of shrinkage. With this knowledge at hand, cloths must be so constructed as to produce the desired finished appearance and hand without relying on this unique property peculiar to the wool fibers.

Problems. The newer hydrophobic fibers have brought with them problems that result from the generation of static electricity charges and lack of moisture absorption, which can result in the attraction of dirt and dust or discomfort in fabrics worn next to the skin. The judicious blending of a hydrophobic fiber with another, such as cotton or rayon, can frequently alleviate the static condition, and the use of such principles as interfiber wicking characteristics can afford a solution to the moisture absorption problem.

Up until recently the use of less than about 50% of nylon staple in blends with cotton was likely to result in a reduction rather than an increase in yarn tensile strength. The newer Du Pont Type 420 nylon staple with modified stress-strain characteristics now makes possible the addition of only 25% nylon in a blend with cotton to give decidedly higher breaking strengths and improved abrasion resistance.

In wool blends, the use of small percentages of nylon to add strength, extend spin limits, and improve abrasion resistance has been practiced for some time.

Once again, the stylist must be familiar with the basic principles of fiber modulus and stress-strain properties before he can be expected to use the man-made fibers to develop new and improved fabrics.

Supplement to the August 1958 issue of
Textile Industries

Properties and uses of

		Rayon[1]			Saponified Acetate "Fortisan"	Acetate	Cellulose Triacetate "Arnel"	Polyamide Fibers		Polyester "Dacron"	A		
		Regular	Medium Tenacity	High Tenacity				Nylon 66	Nylon 6		"Orlon"	"Acrilan"	Dynel
Specific Gravity		1.53	1.53	1.53	1.52	1.33	1.3	1.14	1.14	1.38	1.17	1.17	1.30
Tenacity, grams/denier	Dry (70 F, 65% RH)	1.5-2.4	2.4-3.0	3.0-5.0	7.0	1.1-1.4	1.2-1.4	4.1-8.8	6.3-8.7	3.6-7.0	2.5	2.0-2.7	2.5-3.3
	Wet, % of dry	44-54	56-63	55-65	85	60-65	70	80-90	85-90	100	83	80	100
Tensile strength, 1000 psi (70 F, 65% RH)		29-47	47-58	58-97	138	18-23	20.0-23.3	58-128	98-122	64-124	37	30-40	50
Elongation at break, % (70 F, 65% RH)		15-30	10-20	9-20	6	23-30	25-40	15-45	16-30	9-48	25-35	36-40	30-42
Elastic Recovery (70 F, 65% RH)	% Recovery from % strain	82 30 2 20	82 30 2 20	82 37 2 15	82 67 2 5	94 23 2 20	88 43 3 10	100 8	100 8	97 80 2 8	97 75 2 8	99 89 2 5	97 2
Stiffness, grams/denier (70 F, 65% RH)		8.7	17	25	120	5.2	4.8-5.0	9-52	33-48	7-65	10	7	8.2
Moisture regain, %	70 F, 65% RH	11.5-16.6	11.5-16.6	11.5-16.6	10.0-11.5	6.3-6.5	3.2	4.0-4.5	4.5	0.4	1.0-2.0	1.2-1.6	less than
	Commercial	11.0	11.0	11.0	11.0	6.5	3.5	4.5	4.5	0.4	1.5	1.5	0
Effect of heat		Does not melt.			Similar to rayon.	Loses strength at 194-225 F; softens at 397-406 F.	Before heat treatment, sticking point is 350-375 F; after heat treatment, above 464 F. Melts at 572 F.	Sticks at 445 F; melts at about 480 F.	Melting range: 414-428 F. Slight discoloration when held at 300 F for 5 hours. HBT type retains 90-95% of original tenacity after 24 hrs at 330 F in air.	Sticks at 455 F; melts at 480 F.	Sticks at 455-480 F.	Sticks at 470-480 F.	Softens at 300-325 F; shrinks at temperatu above 240 Fire-resist ant; does support co bustion.
Effect of sunlight		Long exposure results in strength loss.			Similar to rayon.	Similar to rayon; slightly lower per cent loss.	Long exposure results in strength loss.	Significant strength loss after long exposure, except special types. No discoloration.	In general same as nylon 66, but loses strength more slowly; no discoloration.	Some loss of strength; no discoloration; better behind glass.	Resistant	Resistant	Some loss strength.
Effect of chemicals	Acids	About same resistance as cotton; not harmed at low concentrations and temperatures. Disintegrates rapidly in concentrated acids and at high temperatures.			Decomposed by strong acids; resistant to weak acids.	Decomposed by strong acids; soluble in acetic acid.	Similar to acetate.	Decomposed by strong mineral acids; resistant to weak acids.	Same as Nylon 66.	Resistant to most mineral acids; disintegrated by 96% sulfuric acid.	Resistant to most mineral acids; disintegrated by 96% sulfuric acid.	Resistant to most acids.	Generally sistant, ex cept to 25 chromic, 7 nitric, and 96% sulfu
	Alkalies	No effect with cold, weak alkalies; swelling and loss of strength in concentrated alkalies.			Swelling and mercerization in concentrated alkalies; little effect cold.	Saponified; little effect from weak alkalies, cold.	More resistant than acetate; little effect up to pH 9.8, 205 F.	Little or none.	Same as Nylon 66.	No effect, cold; disintegrated by strong alkalies at boil.	Little effect cold; disintegrated by strong alkalies at boil.	Moderate resistance cold; disintegrated by strong alkalies at boil.	Resistant, cept to con centrated caustic.
	Organic solvents	Resistant.			Resistant.	Soluble in acetone, swollen or dissolved by many organic solvents. Softened in alcohol.	Soluble in acetone, chloroform, and methylene chloride. Swelled by trichloroethylene.	Resistant; soluble in some phenolic compounds and in 90% formic acid.	Same as Nylon 66.	Generally unaffected; soluble in some phenolic compounds.	Unaffected by common solvents.	Unaffected by common solvents.	Soluble in acetone an few other solvents.
Dyestuffs used		Direct, developed, azoics, and vats.			Same as rayon.	Disperse, and some azoics.	Same as acetate.	Disperse, neutral-dyeing metalized, acid-dyeing metalized, chrome, some directs.	Same as Nylon 66.	Disperse, developed (azoic).	Disperse, basic, acid.	Disperse, basic, acid, acid- and neutral-dyeing metalized, chrome	Disperse, neutral-dy ing metaliz some neutr dyeing acid some basic
Uses[4]		1, 2, 3, 4, 5, 6, 7			4, 7	1, 2, 3, 4, 5	1, 2, 4, 7	1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6, 7	1, 2, 4, 7	1, 2, 4, 7	1, 2, 3, 4, 7	1, 2, 3, 4, 5, 7

[1] Includes cuprammonium rayon.
[2] Plant under construction; production in late 1958; limited advance marketing from pilot plant output.
[3] Pilot plant production.
[4] Uses:
1. Apparel
2. Upholstery and drapery
3. Floor coverings
4. Other home furnishings
5. Bonded materials
6. Tire cord
7. Other industrial uses

Compiled from information suppl synthetic fibers, supplemented b of Textile Fibers" and "A.S.T.M.

FREE REPRINTS of this chart are available, on the basis of one per reader, so long as the supply la

f the man-made fibers

Supplement to the August 1958 issue of
Textile Industries

Acrylic and Related Fibers					Glass	Saran	Polyethylene		Vinyl "Vinyon"	TFE-Fluoro-carbon "Teflon"	
Dynel	"Verel"	"Creslan"[2]	"Darvan"[3]	"Zefran"			Conventional	Linear			
1.30	1.37	1.18	1.18	1.19	2.56	1.69	0.92	0.95-0.96	1.35	2.3	Specific Gravity
.5-3.3	2.5-2.8	3.0-3.5	1.75	3.5	7.7	up to 2	1.0-2.5	4.0-7.5	0.6-0.7	1.6	Dry (70 F, 65% RH) — Tenacity, grams/denier
100	—	85-95	85	89	99	100	100	100	100	100	Wet, % of dry — Tenacity, grams/denier
50	44-49	37-52	26.5	53	250-315	up to 44	11-30	48-90	10-12	47	Tensile strength, 1000 psi (70 F, 65% RH)
30-42	33-35	25-30	25-35	33	2.5-3.15	15-25	20-60	10-30	10-13	13	Elongation at break, % (70 F, 65% RH)
97 2	79 63 2 5	92 80 2 4	70 45 3 10	99 72 2 10	100 3	98.5 93.0 3 10	95 5	95 80 5 10	99 2	——	% of recovery from % strain — Elastic Recovery (70 F, 65% RH)
8.2	8.0	9.4	11	10.6	300	3-12	2-12	20-40	5.8	7	Stiffness, grams/denier (70 F, 65% RH)
than 0.4	3.5-4.0	1.5-2.0	2.5	2.5	0	0	0	0	0	0	70 F, 65% RH — Moisture regain %
0	—	—	—	—	0	0	0	0	0	0	Commercial — Moisture regain %
ns at 25 F; ks at eratures e 240 F. resist-does not ort com-on.	Fiber properties begin to deteriorate rapidly at 266-302 F. Type FR extremely flame resistant.	Sticks at 433 F.	Softens at 340-350 F. Loses 30% of strength at 250 F, 50% at 300 F. Flammability similar to cotton.	Sticks at 490 F.	Nonflammable; loses 50% of strength at 628 F; softens at 1380-1550 F.	Softens at 240-280 F; melts at 340-350 F.	5% shrinkage at 165 F; melts at 230-250 F.	Shrinks 1.6 to 7.1% at 212 F; melts at 280 F.	Shrinks at 150 F; melts at 250 F.	Nonflammable; gels at 620 F.	Effect of heat
e loss of gth.	Resistant.	Negligible	Resistant	Resistant	None.	Darkens slightly.	Some strength loss for clear filaments, less for pigmented.	Same as conventional; can be stabilized.	None.	None.	Effect of sunlight
rally re-t, ex-to 25% nic, 70% , and sulfuric.	Resistant to most acids.	Resistant to most acids.	Resistant to most acids.	Resistant to most acids.	Attacked by hydrofluoric and hot phosphoric acids.	Resistant to most acids.	Very resistant.	Very resistant.	Very resistant.	Affected only by fluorine and chlorine trifluoride at high temperatures, and by molten alkali metals.	Effect of chemicals — Acids
tant, ex-o con-ated ic.	Resistant.	Fair resistance to weak alkalies; strong alkalies cause yellowing and loss of strength.	Moderate resistance cold; disintegrated by strong alkalies at high temperatures.	Resistant to weak alkalies; destroyed by strong alkalies.	Attacked by concentrated alkalies, and by hot, weak alkalies.	Resistant, except to ammonium hydroxide.	Very resistant.	Very resistant.	Resistant.		Effect of chemicals — Alkalies
le in ne and a ther nts.	Soluble in warm acetone; unaffected by most other common solvents.	Unaffected by drycleaning and other common solvents.	Not affected by drycleaning solvents.	Unaffected by common solvents.	Unaffected.	Swelled or softened by oxygen-bearing solvents at elevated temperatures.	Soluble in some solvents at temperatures above 160 F.	Same as conventional.	Soluble in ketones and chlorinated hydrocarbons; swelled and softened by ethers, esters, and others.		Effect of chemicals — Organic solvents
rse, al-dye-etalized, neutral-g acid, basic.	Neutral-dyeing metalized, disperse, basic, some acid.	Disperse, basic, milling, neutral metalized, acid, acid metalized, chrome, direct.	Disperse, azoic, basic.	Neutral-dyeing metalized, chrome, direct, disperse, sulfur, vat, and naphthol.	Resin-bonded pigments.	Disperse, some azoics.	Practically undyeable.	Same as conventional.	Disperse.	Practically undyeable.	Dyestuffs used
4, 5, 7	1, 7	1, 2, 3, 4, 5, 7	1	1, 2, 4, 7	2, 7	2, 3, 4, 7	2, 7	2, 7	5	7	Uses[4]

supplied by the manufacturers of the
ated by data from "Harris' Handbook
S.T.M. Standards on Textile Materials."

See the other side of this chart for man-made fiber and yarn trademarks and location of producers' sales offices.

Trademarks of man-made fibers a

Designations currently used by American staple fiber, filament yarn, and textured yarn producers

A

Acrilan—Acrylic staple, tow, and fiberfill; Chemstrand Corp.

Agilon—High-stretch nontorque filament yarn; Deering Milliken Research Corp.

Algil — Polyacrylonitrile-polystyrene monofilaments; Polymers, Inc.

Alistran — Metallic yarn; Multi-Tex Products Corp.

Aristocrat — Rayon filament, staple, and tow; American Bemberg.

Arnel — Triacetate filament, staple, and tow; Celanese Corp. of America

Avicron—Latent crimp filament rayon (for tufted products); American Viscose Corp.

Avisco—Rayon filament, staple, and tow; acetate filament; American Viscose Corp.

Avisco Super L—Soil-resistant rayon carpet staple; American Viscose Corp.

Avisco XL — High-strength rayon staple; American Viscose Corp.

B

Bemberg—Cuprammonium rayon filament; American Bemberg

Boltaflex — Saran monofilaments; Bolta Products

Briglo—Bright luster rayon filament; American Enka Corp.

Bristrand — Polyvinyl chloride-polyvinyl acetate monofilaments; Polymers, Inc.

C

Caprolan—Nylon 6 staple and filament; Allied Chemical Corp.

Celacloud—Type "F" crimped acetate staple (for stuffing sleeping bags, mattresses, etc.); Celanese Corp. of America

Celafil—Type "K" acetate staple (for stuffing pillows, comforters, etc.); Celanese Corp. of America

Celaire—Twist-set acetate; Celanese Corp. of America

Celaperm—Solution dyed acetate filament; Celanese Corp. of America

Celaspun—Yarn spun from acetate staple; Celanese Corp. of America

Celatow—Acetate tow; Celanese Corp. of America

Chadolon—Stretch torque yarn; Patentex Corp.

Chromeflex — Metallic yarns; The Metal Film Co.

Chromspun — Solution dyed acetate filament; Eastman Chemical Products, Inc.

C *continued*

Coloray—Solution dyed rayon staple; Courtaulds (Alabama) Inc.

*Color-Sealed**—Solution dyed staple, filament, and tow, various fibers; Du Pont Co.

Colorspun — Solution dyed rayon staple, filament, and tow; American Viscose Corp.

Conomet—Metallic yarns; Shellmar-Betner Division, Continental Can Co.

Cordura—Rayon filament; Du Pont Co.

Covinaire—Rayon filament; Industrial Rayon Corp.

Covingtone—Rayon filament; Industrial Rayon Corp.

Creslan—Acrylic staple, filament, and tow; American Cynamid Co.

*Crinofil** — High-denier-per-filament rayon yarn for stiff or straw-type effects; Du Pont Co.

Cupioni — Thick-and-thin shantung-type cuprammonium rayon filament; American Bemberg

Cupracolor — Solution dyed cuprammonium rayon filament; American Bemberg

D

Dacron — Polyester staple, filament, tow, and fiberfill; Du Pont Co.

Darvan—Dinitrile staple; B. F. Goodrich Chemical Co.

Dawbarn — Saran, polyethylene, and polystyrene monofilaments; Dawbarn Bros.

DLP — Linear polyolefin monofilaments and multifilament yarns; Dawbarn Bros.

*Dream Slub** — Rayon novelty yarn with torpedo-shaped slubs; American Bemberg

Duclé—Bulk textured yarn; Clarence L. Meyers & Co.

Dull-Fast—Dull rayon filament; Industrial Rayon Corp.

Dul-Tone — Rayon filament; Industrial Rayon Corp.

Dynaloft—Textured yarn; Leon-Ferenbach, Inc.

*Dynel**—Acrylic staple; Union Carbide Chemicals Co. ("Dynel" is a generic term, not a trademark.)

E

Eiderlon—Rayon filament; Industrial Rayon Corp.

Englo — Dull luster rayon filament; American Enka Corp.

Estron — Acetate filament; Eastman Chemical Products, Inc.

F

Fairtex — Metallic yarns; Fairtex Corp.

Fiberfrax—Ceramic (aluminum silicate) fiber; Carborundum Co.

Fiberglas — Textile glass fiber; Owens-Corning Fiberglas Corp.

Fibro — Rayon staple; Courtaulds (Alabama) Inc.

Filatex—Covered rubber yarn; American Viscose Corp.

*Flaikona**—Continuous filament rayon flake yarn; American Bemberg

*Flake Slub** — Rayon novelty yarn with short entangled slub; American Bemberg

Fluflon — High stretch torque yarn; Marionette Mills, Inc.

Fortisan—Regular and Type 36 saponified acetate filament; Celanese Corp. of America

45 — Polyvinyl chloride monofilaments; Polymers, Inc.

G

Garan — Textile glass fiber; L•O•F Glass Fibers Co.

Glacelon—High stretch torque yarn; Kenneth W. Glace

Gro-Lon—Stretch torque yarn; Grove Nylon Co.

H

Helanca—High stretch torque yarn; Heberlein Patent Corp.

Helanca Hi-Test — Stretch yarn for half-hose and stretch fabrics; Heberlein Patent Corp.

Helanca NT — Nontorque textured yarn with soft hand and substantial stretch; Heberlein Patent Corp.

Helanca SS—Highly bulked yarn with soft hand and limited stretch; Heberlein Patent Corp.

Helanca SW—Limited stretch bouclé yarn for outerwear; Heberlein Patent Corp.

Hemlon—Textured yarn; Hemmerich Corp.

Hi-Narco — Medium tenacity rayon filament; North American Rayon Corp.

Hytor—Torque stretch yarn; Patentex, Inc.

I

IRC—Nylon staple; Industrial Rayon Corp.

J

Jetspun—Solution dyed rayon filament; American Enka Corp.

K

Kolorbon—Solution dyed, heavy denier crimped rayon staple (for use in home furnishings); Hartford Rayon Co.

L

Lamé—Metallic yarn; Standard Yarn Mills, Inc.

Lektroset—Twist-set rayon filament; Industrial Rayon Corp.

Livolon—Monofilament stretch yarn; Patentex, Inc.

*Long Type "A" Slub**—Rayon yarn with long, parallel, non-entangled slubs; American Bemberg

Lowland — Rayon yarns; American Enka Corp.

Lurex — Metallic yarn; Dobeckmun Co.

Lus-Trus — Saran monofilaments; Southern Lus-Trus Corp.

M

Magiloft—Textured yarn; Madison Throwing Co.

Malora—Metallic yarn; Malina Co.

Matesa — Dull cuprammonium filament; American Bemberg

*Measle Yarn**—Rayon yarn with part tight and part loose filaments; American Bemberg

Metlon—Metallic yarn; Metlon Corp.

Minifil — High-denier, low-filament rayon yarn; American Viscose Corp.

Modiglass — Glass fibers; Modiglass Fibers, Inc.

*Multi-Strata Slub**—Rayon yarn with torpedo-shaped slubs; American Bemberg

Mylast—Crimp-type, nontorque textured yarn; Clarence L. Meyers & Co.

N

Narco—Regular tenacity rayon filament; North American Rayon Corp.

Narcon—Super high strength rayon staple; North American Rayon Corp.

*Nub-Lite** — Nubby thick-and-thin cuprammonium filament; American Bemberg

Nupron — Rayon filament; Industrial Rayon Corp.

Nupronium—Rayon filament; Industrial Rayon Corp.

Nylenka—Nylon 6 staple and filament; American Enka Corp.

O

*Ondulé**—Rayon yarn with randomly spaced, entangled slubs of irregular size and shape; Du Pont Co.

O *Continued*

Orlon—Acrylic staple and
Pont Co.

P

Parfé—Filament rayon yarn
termittently spaced colo
ican Bemberg

Perlglo—Semidull luster ray
American Enka Corp.

Poliafil—Nylon filament; Poli

Poly-Bolta — Polyethylene
ments; Bolta Products

PPG—Textile glass fiber; Pi
Plate Glass Co.

Premier—Rayon filament; I
Rayon Corp.

Q

Quilticel—Insulating materia
tate staple; Celanese
America.

R

Rayflex—High tenacity ray
ment; American Viscose

Raysorb—Yarns used for st
sorbent; American Visco

Reevon — Ultraviolet-stabiliz
ethylene monofilaments;
Bros., Inc.

Reymet—Metallic filament an
Reynolds Metals Co.

S

Saaba — Bulked yarn; U
Winding Co.

*Saran**—Generic name for vi
chloride-vinyl chloride
mers, staple and filament

Shalon—Polystyrene monofil
Polymers, Inc.

Skyloft—Bulked rayon yarn;
can Enka Corp.

Spun-Black — Black solutio
rayon filament; Industria
Corp.

Spunized — Crimp-type bulke
Hartford Spinning Co.

Spun-Lo—Rayon filament; In
Rayon Corp.

*Strata-Slub** — Thick-and-t
prammonium filament; A
Bemberg

Super Cordura—High tenacity
filament; Du Pont Co.

Superloft—Filament yarn mod
the twist-untwist metho
versal Winding Co.

Super-Narco — High tenacity
filament; North American
Corp.

Super Rayflex—Extra high
rayon filament; American
Corp.

ible, on the basis of one per reader, so long as the supply lasts.
e Industries," 806 Peachtree St., N. E., Atlanta 8, Ga.

and yarns and where to get them

S *Continued*

Super-Suprenka—High tenacity rayon yarn for tires; American Enka Corp.

Superwind—Rayon filament; Industrial Rayon Corp.

Suprenka—Extra high tenacity rayon filament; American Enka Corp.

T

Taslan—Loop-type, nonstretch bulked yarn; Du Pont Co.

Teflon—TFE-fluorocarbon staple, filament, and tow; Du Pont Co.

Tempra—High tenacity rayon filament; American Enka Corp.

Textralized — Crimp-type, stretch nontorque yarn; Joseph Bancroft & Sons Co.

*Tinselfil**—Rayon yarn having high luster and crystal-like sparkle; Du Pont Co.

Tycora — Textured filament yarns; Textured Yarn Co.

Tyron—High tenacity rayon filament; Industrial Rayon Corp.

U

Uniformat — Textile glass fibers in mat form; Fiber Glass Division, Ferro Corp.

V

Velon — Saran monofilaments; Firestone Plastics Co.

Velon LP—Linear polyethylene monofilaments; Firestone Plastics Co.

Verel — Modified acrylic staple and tow; Eastman Chemical Products, Inc.

Veri-Dul—Dull rayon filament; Skenandoa Rayon Corp.

Vinyon—Vinyl chloride-vinyl acetate copolymer staple; American Viscose Corp.

Viscalon "22"—Normal tenacity, fine denier rayon staple; Hartford Rayon Co.

Viscalon "44"—Heavy denier smooth rayon staple; Hartford Rayon Co.

Viscalon "66"—Heavy denier crimped rayon staple, for use in home furnishings; Hartford Rayon Co.

Vitron — Textile glass fiber; L•O•F Glass Fibers Co.

W

Wynene — Polyethylene monofilaments; National Plastic Products Co.

Z

Zefran—Acrylic alloy staple and tow; Dow Chemical Co.

*Not a trademark

Sales offices of fiber producers and owners of textured yarn patents

Allied Chemical Corp.
261 Madison Avenue
New York 16, N. Y.

American Bemberg
261 Fifth Avenue
New York 16, N. Y.

American Cyanamid Co.
Fibers Division
111 West 40th St.
New York 18, N. Y.

American Enka Corp.
530 Fifth Avenue
New York 36, N. Y.

American Viscose Corp.
1617 Pennsylvania Blvd.
Philadelphia 3, Pa.

Joseph Bancroft & Sons Co.
Wilmington 99, Delaware

Bolta Products
P. O. Box 61
Lawrence, Mass.

Carborundum Co.
Buffalo Avenue
Niagara Falls, N. Y.

Celanese Corp. of America
180 Madison Avenue
New York 16, N. Y.

Chemstrand Corp.
350 Fifth Avenue
New York 1, N. Y.

Courtaulds (Alabama) Inc.
600 Fifth Avenue
New York 20, N. Y.

Deering Milliken Research Corp.
Pendleton, S. C.

Dobeckmun Co.
A Division of the Dow Chemical Co.
350 Fifth Avenue
New York 1, N. Y.

Dow Chemical Co.
Textile Fibers Department
Williamsburg, Virginia

E. I. du Pont de Nemours & Co., Inc.
Textile Fibers Department
Wilmington 98, Delaware

Eastman Chemical Products, Inc.
260 Madison Avenue
New York 16, N. Y.

Fairtex Corp.
1808 Liberty Life Bldg.
Charlotte 2, N. C.

Ferro Corp.
Fiber Glass Road
Nashville 11, Tenn.

Firestone Plastics Co.
307 Fifth Avenue
New York 16, N. Y.

Kenneth W. Glace
Pilot Mountain, N. C.

B. F. Goodrich Chemical Co.
3135 Euclid Avenue
Cleveland 15, Ohio

Grove Nylon Co.
150 E. Grove St.
Scranton 10, Pa.

The Hall Co.
41 E. 42nd St.
New York 17, N. Y.

Hartford Rayon Co.
140 Madison Avenue
New York 16, N. Y.

Hartford Spinning Co.
Unionville, Conn.

Heberlein Patent Corp.
350 Fifth Avenue
New York 1, N. Y.

Hemmerich Corp.
Denver, Pa.

Industrial Rayon Corp.
500 Fifth Avenue
New York 36, N. Y.

Leon-Ferenbach, Inc.
274 Madison Avenue
New York 16, N. Y.

L•O•F Glass Fibers Co.
1810 Madison Avenue
Toledo 1, Ohio

Madison Throwing Co.
Madison, N. C.

Malina Co.
125 W. 41st St.
New York 36, N. Y.

Marionette Mills, Inc.
P. O. Box 430
Coatesville, Pa.

The Metal Film Co.
40 Worth Street
New York 13, N. Y.

Metlon Corp.
432 Fourth Ave.
New York 16, N. Y.

Clarence L. Meyers & Co.
2nd & Somerset Streets
Philadelphia 33, Pa.

Modiglass Fibers, Inc.
Florham Park, N. J.

Multi-Tex Products Corp.
56 Elm Street
Newark 5, N. J.

The National Plastic Products Co.
Odenton, Maryland

North American Rayon Corp.
261 Fifth Avenue
New York 16, N. Y.

Owens-Corning Fiberglas Corp.
598 Madison Avenue
New York 22, N. Y.

Patentex, Inc.
350 Fifth Ave.
New York 1, N. Y.

Pittsburgh Plate Glass Co.
One Gateway Center
Pittsburgh 22, Pa.

Poliafil, Inc.
311 Palm Street
Scranton 5, Pa.

Polymers, Inc.
Middlebury, Vt.

Reeves Bros., Inc.
1071 Sixth Ave.
New York 18, N. Y.

Reynolds Metals Co.
Reynolds Metals Bldg.
Richmond 18, Virginia

The Saran Yarns Co.
Odenton, Maryland

Skenandoa Rayon Corp.
261 Fifth Avenue
New York 16, N. Y.

Standard Yarn Mills, Inc.
83rd St. & Cooper Avenue
Glendale 27, N. Y.

Textured Yarn Co., Inc.
40 East 34th Street
New York 16, N. Y.

Union Carbide Chemicals Co.
Textile Fibers Department
100 East 42nd Street
New York 17, N. Y.

Universal Winding Co.
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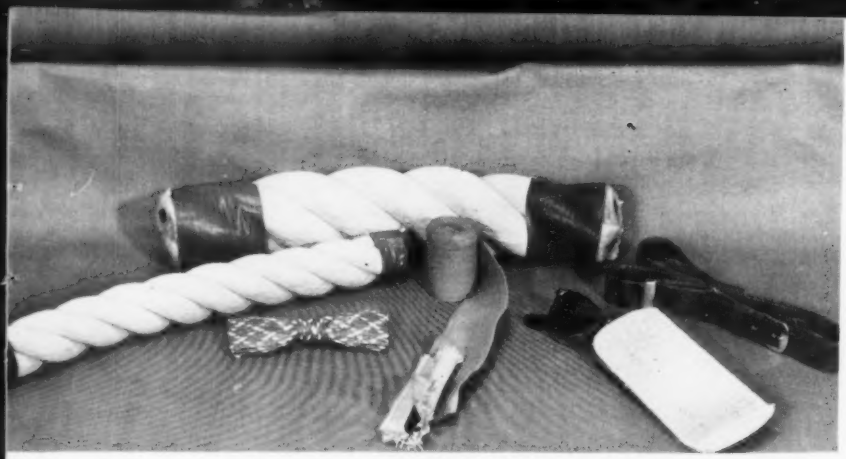
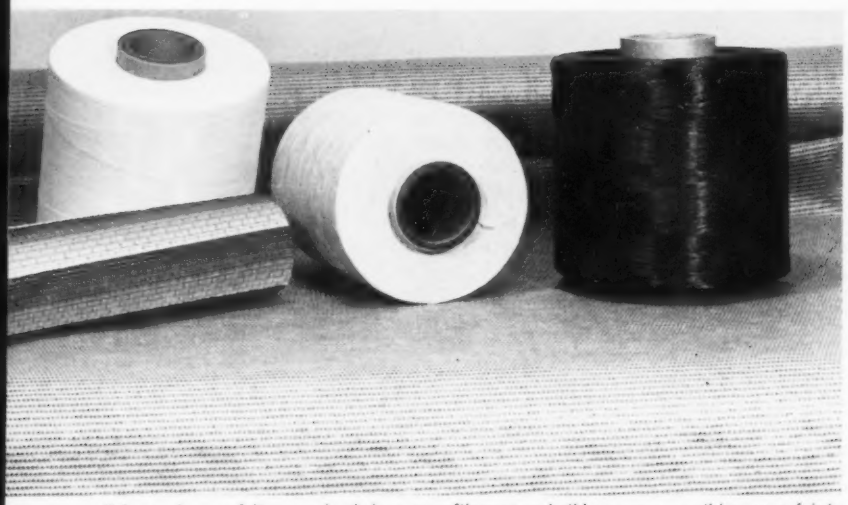


Rope made from linear polyethylene monofilaments (at top—9" rope, 2½" diameter). In center foreground, automobile windlace or weatherstripping, showing the lace tape from which made, and bow tie for service uniforms, both made from ribbon yarns. Also shown are DLP belt and case for glasses.

Polyolefin Fibers: The Current Position



Tube packages of linear polyethylene monofilament and ribbon yarns, on ribbon yarn fabric.

by C. T. Kennedy
Vice-president and chief engineer
Dawbarn Brothers, Inc.

Exclusive

RAPID strides have been made in the polyolefin fiber field during the past two years. Linear polyethylene* has been the fastest rising star, largely in the monofilament form, although ribbon yarns have also made substantial moves in the last year.

After their introduction in 1955, linear polyethylene monofilaments reached a level of about 100,000 lb in 1956, but climbed to over one million lb for the 12 months' period ending mid-1958. Early growth was restricted by shortage of resin raw material until the middle of 1957, when the first large scale supply became available.

Because of the rapid gains made by linear polyethylene fibers, this article will focus on this member of the polyolefin family. Let us first digress to explain what we mean by "polyolefins." Polyethylene and polypropylene are polyolefins and many more have been made in the laboratory, e. g., polybutylene, and copolymer combinations of ethylene, propylene, and butylene.

Radical new techniques of making polymers, especially polyolefins, were developed by Zeigler in Germany, Natta in Italy, and Phillips and others in this country.

Linear polytheylene was the first commercial realization of these revolutionary techniques, and linear polypropylene has practically reached that status.

Others will surely follow in the next decade, but at this stage the commercial polyolefins are: branched polyethylene, linear polyethylene, and linear polypropylene. Linear polyethylene and branched polyethylene are very similar chemically but are property-wise as different as any two thermoplastic materials, more different than stainless steel and ordinary carbon steel.

Turning now to linear polyethylene fibers, it seems appropriate to discuss end products which have achieved commercial significance before considering the properties of these fibers.

*Also called high density polyethylene or low-pressure polyethylene, which alludes to the process of manufacture. Branched polyethylene is the older type—also called low density polyethylene, high-pressure polyethylene, conventional polyethylene, I.C.I. polyethylene.

END USES OF LINEAR POLYETHYLENE

Rope and Cordage. Even though the cordage industry has never been thought part of the textile industry, more and more conventional textile yarns are going into this end use. Linear polyethylene monofilament, usually in the 600-denier form, has now joined nylon, Dacron, and cotton as a rope and cordage yarn.

Linear polyethylene rope was introduced in 1956 and enjoyed a phenomenal acceptance as a water ski tow rope, based upon its characteristics of strength (1,100-pound breaking strength for a ¼" rope), colorfulness (color built into monofilaments), and the fact that it is lighter than water. This last property eliminates the need for floats and prevents propeller fouling, which is not uncommon with conventional hemp ropes.

Linear polyethylene ropes also enjoy the other advantages common to most plastics, such as lack of water absorption and complete imperviousness to rot or mildew. Both twisted and braided constructions are popular for small lines, 1/4" to 5/8" diameter. Acceptance for all sorts of small boat uses, mooring lines, etc., has followed in the wake of water skiing uses.

Acceptance in industrial cordage applications has been necessarily slower, but the future looks bright. Ropes up to 2" diameter have been made and are proving successful in oil well work and look promising in marine hauling applications. Linear polyethylene rope will be a vigorous competitor of nylon, Dacron, and manila hemp ropes.

Monofilament Fabric. Saran has long dominated the monofilament fabric field, where the end uses are automobile seat covers and original upholstery, broad woven fabrics for outdoor chairs and cots, golf bags, and similar miscellaneous uses. Linear polyethylene has been replacing part of the saran in these fabrics; in fact, a 50-50 fabric was recently approved by a monofilament weavers group. By using one-half saran and one-half linear polyethylene, acceptance has been speeded for a product relatively unproved in the demanding American market, in spite of voluminous laboratory test data and considerable time consuming service testing. Fabric of 100% linear polyethylene monofilaments has also been marketed for outdoor furniture.

Columbus Fiber Mills have pioneered in the weaving of both types. Saran has better crease recovery than monofilament linear polyethylene, but where vital, it can be overcome by use of the 50-50 fabric or by using the ribbon yarn form of linear polyethylene. Advantages over saran are: better color stability to fading or darkening on exposure to sunlight, better low temperature flex life, lower cost, and freedom from plasticizer exudation (a mild but troublesome form of crocking) problems.

The color stability advantage is not great over currently used 909-saran introduced 4½ years ago to replace 115-saran. The latter is very susceptible to darkening in sunlight and, unfortunately, is still used to a considerable extent although the price is the same.

Automotive Uses. Working with Dawbarn Brothers' DLP3* ribbon yarn in combination with cotton, Bridgeport Fabrics developed a windlace fabric. This fabric covers a ½" diameter sponge rubber core, and is used for weatherstripping around the inside of automobile doors (see photograph of finished products). It was used in three 1958 Ford models: Thunderbirds, police cars, and taxi cabs. This same construction (linear polyethylene ribbon and cotton combination) windlace will be used in these same three models for 1959.

Another Detroit automobile company has adopted this same construction for many models in its 1959 line. The linear polyethylene ribbon yarn, which is the face yarn, looks better, gives much improved color life (practically no fading), has better abrasion resistance, and less wicking than the cotton fabric. The unsightly staining because of wicking is a serious drawback of the all-cotton windlace.

Two automobile companies have approved and production has already begun on combination fabrics made with DLP ribbon for body cloth on 1959 models. These fabrics, which were developed by Columbus Fiber Mills, use the linear polyethylene ribbon in combination with saran and nylon in trucks and station wagons, and with saran and rayon in closed cars. The ribbon is used both as a decorative yarn and as part of the main body.

Although the linear polyethylene ribbon yarns have many desirable attributes (discussed below), the fact that new and attractive fabrics can be made is undoubtedly their strongest selling point.

Webbing for Outdoor Furniture. Here again we find linear polyethylene monofilaments replacing saran. In some cases 400/1/0 linear polyethylene monofilament is used only in the filling of the 2½" webbing, but in other cases 1100F/1/0 flat monofilament is used in the warp as well as the 400 denier in the filling. Properly formulated colors in linear polyethylene monofilament have better resistance than 909-saran to color change on long outdoor exposure; the darkening which occurs in saran is almost completely lacking in linear polyethylene.

Although properly formulated linear polyethylene monofilaments are at least equal to the old 115 type saran in regard to retention of strength on outdoor exposure, they are not as good as 909-saran. The old 115-saran is still used predominately in outdoor furniture webbing.

Relatively poor linear recovery of linear polyethylene results in some sagging in an unsupported seat and represents a possible disadvantage. 909-saran also exhibits sagging. It is only the continuous shrinking under heat from the sun of 115-saran which keeps a 115-saran web taut.

Shoes, Belts, and Handbags. DLP3 ribbon yarns are braided around cores for belts or knitted for shoe and purse fabrics. Thomas Taylor & Sons, Inc., was among the very first to see the potential of DLP3 ribbon fabrics, and promoted many of these uses. Linear

*Dawbarn Brothers' DLP3—Ribbon (DLP is Dawbarn's registered trademark for Dawbarn linear polyolefin fibers).

polyethylene ribbon is in part replacing raffia yarns in these applications.

Even though there is as yet no real volume, these uses are already proved. Linear polyethylene monofilaments are also used with ribbon yarns in some knitted fabrics.

In view of all development work under way, it seems inevitable that many more applications will reach commercialization in the coming year.

Filter Fabrics. Linear polyethylene monofilaments are replacing branched polyethylene monofilaments in filter fabrics on the basis of superior strength, better abrasion resistance, and better dimensional stability. They are also finding applications in other filter uses, both for liquid filtration and gaseous filtration.

Chemical inertness and resistance to chemical attack is even better than that of branched polyethylene, which has very good resistance itself.

Yarns Available in Linear Polyethylene. Round monofilaments in sizes from 150 denier (.006") to 600 denier (.012") and in flat monofilaments (oval or rectangular cross section) from 560 to 1300 denier are currently being commercially produced. Experimental samples of multifilaments have been seen from time to time, but real developments have not progressed much. Presumably several big synthetic fiber producers have examined linear polyethylene multifilament yarn and have rejected it, primarily because of numerous problems in manufacture.

Properties of Linear Polyethylene

	Monofilaments	Ribbon
Deniers Available	Round: 150-600 (.006"-.012")	750-1500
	Flat: 560-1300	
Tenacity, gpd (1)	4.0 to 7.5	3.0 to 4.0
Tensile Strength, lbs per sq in (1)	48,000 to 90,000	36,000 to 48,000
Elongation at Break, % (1)	10 to 30	30 to 50
Wet Tenacity, % of Dry	100%	100%
Knot Tensile, % of Straight Tensile (1)	50%	80%
Recovery from linear strain (2) — Strain %	5	10
Recovery %	95	80
Modulus of Elasticity, gpd	20 - 40	
lbs per sq in (3)	240,000 to 480,000	
Stiffness, average, gpd (4)	20 - 40	
Shrinkage at 212 F for ½ min, %	4 to 8	4 to 7
Moisture Regain	Nil	
Moisture Absorption	Nil	
Specific Gravity	.95-.96	
No-Strength Temperature	265-280 F	
Low Temperature Brittleness of Fabric—Flex Life at 20 F	Over 150,000 Cycles	
Cold Crack at 50 F	No Cracking	
Abrasion Resistance	Good	
Flammability	Will support combustion but burns slowly	
Electrical Properties	Excellent insulator and exhibits low dielectric loss	
Chemical Resistance		
Strong Acids	Very resistant	
Strong Alkalis	Very resistant	
Organic Solvents	Very resistant, but some solvents soften at elevated temperatures	
Mildew Resistance	Excellent	
Color Stability	Excellent, only very slight fading for some colors at 500 Fade-Ometer hours	
Outdoor Strength Stability	Good, 4 to 5 year life in seat covers	

(1) Determined at constant rate of elongation of 120% elongation per minute, or 12"/minute for 10" sample.
(2) Loaded for 30 seconds; recovery measured after 60 seconds.
(3) Determined from slope of stress-strain curve obtained under conditions of (1).
(4) Determined at yield point.

PROPERTIES OF LINEAR POLYETHYLENE FIBERS

Advantages. It can be seen from the table of properties that from the standpoint of a textile yarn, linear polyethylene has many advantages. Strength is high, and low specific gravity means it is economical. Stability to weathering is good from the standpoint of dimensions, strength, and color (because filaments are "dope-dyed").

It is resistant to all chemicals, solvents, acids, and alkalis at room temperature; a number of hydrocarbon-type solvents and strong oxidizing solutions have a deleterious effect at elevated temperatures (150 F - 250 F).

Disadvantages. Low melting point of 275 F, lack of resilience, and poor recovery from bending or folding are salient disadvantages. It is very difficult to dye. Monofilaments possess about the same stiffness as nylon monofilaments, but this can also be an advantage.

Versus Branched Polyethylene. Linear polyethylene definitely overcomes the two causes of the disastrous failure of branched polyethylene in seat cover applications when it was tried ten years ago; namely, lack of dimensional stability and poor resistance to outdoor aging. Linear polyethylene monofilaments are stiffer, three times stronger, and have a 50 F higher melting point.

Branched polyethylene does have advantages of better resilience, better flexibility, and its shrinking ability makes possible its use as a shrinker yarn.

Creep. As a thermoplastic material, linear polyethylene exhibits creep or cold flow to a marked degree. Under a sustained or dead load considerably less than its dynamic breaking strength, a linear polyethylene filament continues to elongate and eventually break. Creep is a real factor only in a rope

and should be of no concern in normal textile applications.

The creep characteristic was brought to the fore only a year ago when different types of linear polyethylene resin became available and showed creep differences which manifest themselves in rope breaking strength value.

In the winter of 1957 after considerable work with resin suppliers and rope makers and after improvement of the process for making the fiber itself, we introduced our DLP2 monofilaments, with vastly improved creep properties. A seven-fold increase in time to break was achieved at the critical loading of 1.25 gpd (15,000 lb per in.). This load is about 20% of dynamic breaking strength at a rate of draw of 120% elongation per minute. It might be worth noting that rate of draw has a marked effect on tenacity, so that at 2% elongation per minute draw rate, the tenacity is 65% of tenacity at the 120% rate.

Linear polyethylene fibers are not unique in this characteristic of creep under load; nearly all materials have it, from metals to nylon (a thermoplastic). Nylon multifilament, for example, shows roughly equivalent hours to break at the same load of 1.25 gpd (14% of dynamic break); however, nylon will support a 2.75 gpd load (38% of dynamic break) for several days while a DLP2 monofilament lasts less than one hour at this level of loading, according to one test.

Heat and UV Light Stability. Stabilization against loss of properties under exposure to heat is a must, since there are so many uses where sustained heat prevails, e. g., inside automobiles, outdoor furniture. Very effective heat stabilizers are incorporated into linear polyethylene fibers and increase the heat life many fold.

Nothing approaching this degree of improvement has been accomplished in UV life, i. e., resistance to degradation from ultraviolet rays in sunlight, even though the mechanism of degradation is apparently similar, i.e., oxidation. Fortunately the present linear polyethylene resins are basically resistant to UV degradation, especially in oriented fibers, unlike branched polyethylene. The basic structure of the two explains this. This good resistance to loss of strength has been further increased by UV stabilizers and proper selection of pigments and by dispersing these pigments in the fiber.

Our yarns have been improved five-fold since 1956, so that now a 4 to 5 year useful life is confidently predicted for automobile seat covers, on the basis of extensive Fade-Ometer and Weather-Ometer laboratory exposures, Florida and Arizona outdoor exposures both under glass and direct, and also actual service installations as seat covers in Oklahoma, Florida, Georgia, and Virginia.

As compared with other fibers for resistance to outdoor weathering, Orlon, 909-saran, and possibly the latest stabilized nylon would be rated above DLP linear polyethylene yarns. Below DLP we find 115-saran, Dacron, viscose, ordinary nylons, and acetate.

EXTRUSION OF LINEAR POLYETHYLENE MONOFILAMENTS

Like most plastic monofilaments (saran, polystyrene) pigments are added for color prior to extrusion. The pea-size pellets of resin (plastic) are fed to an extruder, which is roughly comparable to a heated, elongated hamburger machine. The plastic is melted and forced through small holes to form the filaments. These filaments are drawn away through water to cool and then into hot water where they are stretched or oriented up to ten times their original length.

Even though similar in general to other monofilament extrusion or dry spinning processes, in actual practice many equipment modifications and special techniques have been required to handle linear polyethylene effectively so as to produce quality products. Variations in quality of resin pellets have been a serious source of trial, variations within one type as well as differences among the various types.

Unlike saran, which is packaged on a returnable wooden spool, Linear Polyethylene filaments are packaged on a disposable cardboard tube (2″ inside diameter by 7″ long, see illustration), originally introduced by us. Thus high speed warping is possible and, in addition, a larger package is practicable.

OTHER POLYOLEFINS

Branched Polyethylene. Uses for branched polyethylene monofilaments continue to be in aircraft tow targets, filter fabrics, and as shrinker yarns in 3D and puff-type fabrics. It was for this last end use that Reeves Brothers recently brought out a shrinker yarn with a higher melting point to correct breakage encountered in an automotive seat upholstery fabric when covered with clear vinyl seat covers. In this case actual temperatures of 200 to 220 F were measured. The improved shrinker yarn is made from a blend of linear and branched polyethylene.

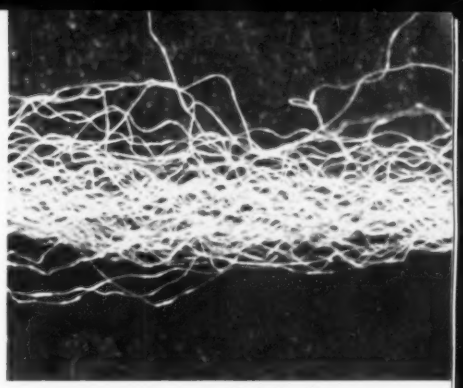
The only real future for branched polyethylene monofilaments appears to be as shrinker yarns, and perhaps a few other limited applications. At least one producer (Dawbarn Brothers) has withdrawn from branched polyethylene monofilament production in order to concentrate on linear polyethylene and the newer polymers coming along, such as polypropylene.

Polypropylene. Much interest has been generated recently in polypropylene filaments, especially multifilaments, but nothing has reached the commercial stage as yet. Montecatini first displayed fiber and fabric samples over a year ago. Polypropylene fibers definitely look interesting, but much work remains to be done, notably improvement of their aging properties. We are making polypropylene multifilament, monofilament, and ribbon yarns for preliminary evaluations.

Polypropylene is chemically related to linear polyethylene and shares its very good resistance to chemicals, solvents, acids, etc. It has a 60 F higher melting point, better resilience, and does not have the waxy feel associated with the polyethylenes.

What's new in textured yarns

Including results from a survey of 40 producers, throwsters, and users



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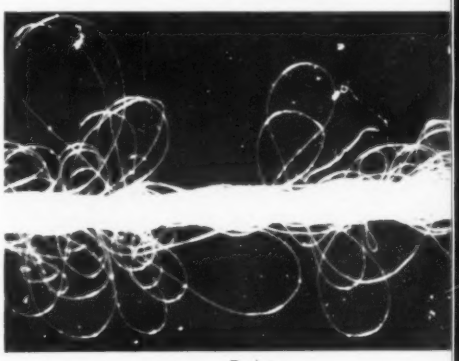


Taslan

by Eldon Stowell
Sales manager, throwing machinery
The Fletcher Works, Inc.

Exclusive

EARLY in 1958 over 40 producers, throwsters, knitters, and others in the textile industry were asked the question, "Are textured yarns here to stay and if so, why?" These concerns were carefully selected; they were pioneers in this comparatively new textile concept and a vital part of today's textured filament yarn industry. The answers varied in that some said it was augmenting filament sales by yarn producers reported that it was augmenting filament sales by as much as 15% over 1956.

When the final figures were totaled an estimate of approximately 60 million pounds was reached, as compared with only 8 million pounds in 1954.

In a recent talk before the National Knitted Outerwear Association, a nylon producer's representative made the prophecy that textured filament yarn production would be five times as great in the next five years.

For the fiber, yarn or fabric manufacturer any new development, whether it is a Helanca yarn swim suit or the sack dress, is always a boon to sales. Such is the case with textured filament yarns, for in the 1954-57 period first stretch, then bulk yarns have certainly created a new and sizable market.

However, any new development takes time to conceive, develop, and market. The Du Pont company advised, "With as many as 72 new fibers in the laboratory, it takes us 12 years to get one of them from its initial creation to the store counter." Textured yarns are not new fibers and they are always one step behind the advent of any new filament yarn.

Fundamentally, the textured, stretch, or bulk yarns are produced by a mechanical distortion of the parallel filaments of the man-made yarn. Historically, filament distortion is over 20 years old, but has only been developed since 1950 and perfected since 1953.

Numerous domestic and foreign patents have been issued to yarn producers, as well as to independent inventors and research workers associated with machinery manufacturers and mills.

The purpose of all such processes is either to increase bulk or to greatly increase fiber elongation to a point where a stretch or elastic yarn results. The filaments do not lie parallel to each other and hence they offer cover without weight, with the advantages of no pilling. The lengthy process of staple spinning offers a yarn in which the fibers are essentially parallel and yet intertwining about each other to give a bulk yarn. Textured yarns should not be confused with the so-called high bulk staple yarns, in that the initial filament remains intact.

Current Texturizing Processes. Many articles have been written about the fundamental concepts of how a yarn is texturized. In the past several years certain processes have become obsolete. These include the knit, heat-set, and unravel, plus the gear crimped methods. The four survivors are the twist, stuffer box, edge, and air jet methods.

Today four producers, Du Pont, Enka, Eastman, and Celanese utilize the air jet process (e.g., Du Pont's Taslan) to produce a core or loop yarn. This process is also licensed to other fabricators of yarns. Recently the Du Pont Co. acquired the Enka Co. patents on a similar technique.

Five companies have licensed processes based upon patents assigned or pending:

Joseph Bancroft & Sons Co.; Textralized (formerly Ban-Lon)—stuffer box method

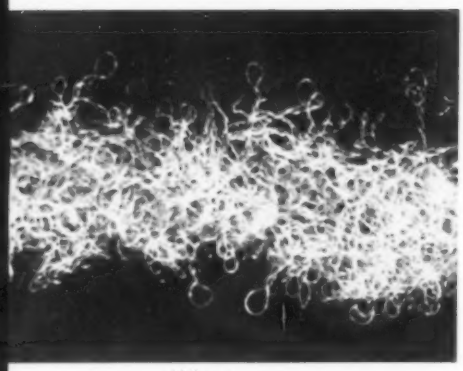
Spunize Co. of America, Inc.; Spunize—multiple-end stuffer box method

Deering Milliken Research Corp.; Agilon—edge crimping method

Textured Yarn Co., Inc.; Tycora—stuffer box method

Heberlein Patent Corp.; Helanca—conventional and false twist methods

Of these, Bancroft and Heberlein do not produce yarns, but only license the process. There are also certain other processes licensed by the machinery manufacturer, especially in the stretch fields. Under certain patents such products



Helanca

as Superloft, Fluflon, and Saaba have had considerable success in the stretch and more recently in the bulk fields.

Many companies prefer to give their own identity to products, even though they are made under license, as for example Dynaloft (Leon-Ferenbach), Magiloft (Madison Throwing Co.), Mylast (Clarence L. Meyers & Co.), and Hemlon (Hemmerich Corp.).

Such is the over-all picture as to what is available in textured yarns in 1958. In spite of phenomenal growth, there still remains a certain amount of justifiable doubt in the minds of those who are not in textured yarns, and it is the purpose of this article to further clarify the picture by referring to the major factors which one must consider when examining a new product.

Producers. Excluding the Taslan process, which is presently used to a large degree by fiber producers, textured yarn production is a "middle-man industry," the middle man being the throwster or yarn spinner. His customers to date have been primarily the hosiery, girdle, and sweater knitters. Woven fabrics are expected to reach the market later this year.

There are several vertical organizations, such as Burlington, Stevens, and Deering Milliken, who manufacture fabric from both stretch and bulk yarns which they make under license agreement, but these are the exceptions rather than the rule. This type of concern is estimated to produce 20 per cent of stretch and bulk yarns, the balance being made by independent yarn processors, and of course by the fiber producers.

The number of licensed processors in the U. S. and Canada is:

Textralized—20
Agilon—16
Helanca—52
Fluflon—14
Superloft—16
Saaba—10
Tycora—2
Spunize—1

Although it might be thought at first glance that the process with the largest number of licensees would account for the largest volume, this is not necessarily the case. Poundage-wise, Helanca and Textralized are the leaders in the so-called independent group. There are other processes with larger numbers of licensees, but they each account for less than 100,000 pounds annually.

Patents. To those investigating the textured yarn fields, the value of the patents on a particular process becomes important. To the writer, the patent situation in the textured yarn field is shrouded in mystery. According to the experts, a world-wide system of patents has been suggested and would in the case of these yarns seem almost imperative.

To date, certain fiber producers have basic claims on fibers and their deformation, and more especially on the raw materials which they produce. The "independents" and others have patents of value for various methods of texturizing, but it must be remembered that these are only methods for modifying an already existent yarn.

Most of the yarn processors under today's licensing agreements have gone along with these patents. With two notable exceptions—one involving an "independent" and a mill chain, the other between two machinery manufacturers — there have not been many cases of patent interference or court cases. The reasons are obvious—the yarn processors, in general, are small and are reluctant to test a particular patent's validity.

The patent situation, with all the multiple claims, is, in the writer's opinion, so garbled that even expert legal advice is not of much value. It is worth noting that some concerns are operating with "secret" processes or producing textured yarns which may be minor modifications of, or even exact copies of, patented processes in the four systems mentioned previously.

Chemical Texturizing. The producer has limited himself thus far to the air jet loop or core bulk method on cellulosic fibers, principally acetate. Eastman, Celanese, Du Pont, and Enka are the leaders in the field, and production reached a total of over 7 million pounds for 1957.

The producer of man-made fibers has from time to time entered into competition with his customers, as in the case of thrown yarns for hosiery and now textured yarns. However, basically he wants to produce a fiber and not to engage in a "drug store" business of yarn processing in a multiproduct endeavor.

Again in the textured field, especially with the gradual decline of rayon continuous filament yarns, the possibility of producing a bulk or stretch yarn at the spinnerette stage has proved a tempting bait, and the middle-man processor, unable to compete with his large supplier, views with alarm this tendency on the part of the yarn producer.

The newer mechanical developments put the producer in an advantageous position for making the entire package available to the end user—the knitter and weaver. The present licensees and especially a new concern, faced with these doubts, are reluctant to commence on ventures which not only entail sizable capital outlays, but also long-term commitments on royalty payments.

Today we find new and basic concepts arising in the art of texturizing, as exemplified by the latest water-crimpable rayon yarn, Avicron, of particular interest in tufted articles, currently being produced by the American Viscose Corp. It has been reported on good authority that two European companies have experimentally produced both acrylic and polyamide textured yarns by chemical rather than mechanical means.

No one can foresee the extent of such research, but it is obvious even to the layman that if greatly increased filament bulk can be obtained with chemical treatment at

the yarn forming stage that this may be a far more economical method than the best of texturizing by mechanical methods.

New Developments. During the past year there were no new basic processes reported. The edge crimp process is still not considered important in volume production.

Some highlights of other developments are as follows:

Spunize Corp. of America, apparently well protected by patents, has perfected its multiple end process and is considering production with possible licensing, especially in heavier deniers of nylon.

Heberlein Patent Corp. has developed a false twist spindle capable of speeds three times higher than those in use today. This air bearing spindle should enable greatly increased production of stretch yarns, and work is continuing at the company's High Point, N. C., laboratories.

Clarence L. Myers Co.'s developments in Mylast indicate that these yarns are finding applications in upholstery and rug uses.

Joseph Bancroft & Sons Co. and Foster Machine Co. have increased production and improved quality of Textralized (formerly known as Ban-Lon) yarns.

Textured Yarns Co. has reported no less than 11 processes for weaving, carpet, upholstery, and drapery yarns.

These are just a few of the developments currently under way. In general, simplification of process and higher speeds seemed to be the net result of research during the period. Production of 200 yards per minute of bulk yarns, 300 yards a minute on air jet, and 40 yards a minute on the twist principles were either achieved or hopefully sought after.

Prices and Products. During the last year the textured yarn industry suffered along with the rest of the textile industry. On the profit side, the Textralized licensees along with those of Tycora did well and should so continue to have profitable operations. Among the stretch producers, both conventional and false twist, the price continued to drop to the point where profits were smaller, although volume was substantial. Prices of textured yarns are higher than those of comparable spun yarns.

The main complaint of a number of concerns continues to be the number of companies competing for a particular market. As one producer stated, "A licensor of a process should take a realistic approach by limiting the number of licensees and maintain quality and price, in view of the investment required for machinery."

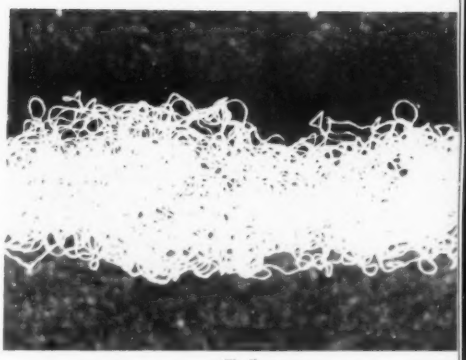
This concept is shared by all the yarn processors and nonadherence to price has been the reason why the middle-man, the yarn processor, is so reluctant to enter a new field while those in it may be suffering. For example, a 70/2 nylon stretch sold for $4.10/lb in 1955 while today it sells for $2.55.

In most cases machine amortization has been realized but as one throwster remarked, "We're working two shifts but we're not making any money."

Prices for textured yarns will follow the law of supply and demand, but the newness of these yarns coupled with good promotion, especially in the knitted outerwear field, has enabled a comparatively high price to be maintained.

With all the activity, where is the processor and producer actually selling his yarn? In 1955, stretch yarns in men's socks were the principal application. Today it is stretch yarns for socks, girdles, tights, bathing suits, and intimate apparel. However, since that time two other newcomers have captured a sizable market. These are the Textalized yarn to a greater, and Tycora to a lesser, degree in ladies' and children's outerwear and the Taslan processed yarns for woven apparel and rug uses.

The advantages of textured yarns in apparel applications are obvious—softer, woolier hand; greater moisture absorption; nonpilling; more body comfort; more bulk and cover. However, in the 1957 yearly retrospect one of the leading producers remarked, "The nylon sweater field is fairly well saturated. Our thinking is for woven fields and in heavy deniers in upholstery and rugs." Such comments are logical in that the economic barrier of lower prices may not be reached until 1960.



Fluflon

With such a critical material as the thermoplastic synthetics, many problems in manufacture have resulted. The cellulosics undergoing processing for rug applications do not require nearly such critical conditions as the polyamides and polyesters being subjected to filament deformation. Tension, heat differences, twist, and pressure are all factors in causing knit barré, filling bands, streaks, and differential stretch and bulk. Today's claims from knitters and weavers to the yarn processor are remaining high.

Potential. In spite of these adverse comments, we must again go back to the tremendous 700% growth of these yarns in the past three years, and an investigation as to why "textured yarns are here to stay." These yarns do compete with spun yarns, whether Orlon, wool, Dacron, or fur blends and others. In the outerwear field, Orlon and Acrilan have suffered during the past year. In rugs, solution-dyed Taslan-type yarns and other processed yarns have taken some of the spun nylon and wool business, along with that taken by the acrylics.

Woven goods are just commencing to appear in shirts, dresses, upholstery, and some industrial fabrics. The economies are, however, limited in all processes, excepting those involving the cellulosics by the Taslan method, by three important factors: denier size, denier per filament, and royalties.

The denier size of most textured yarns is in the 70-200 range, with initial cost of $1.50-$1.70 per pound. Royalties could add up to

an additional 25c per pound. With nylon staple at an equivalent $1.60 per pound the economies to a knitter or weaver must be carefully evaluated.

Fine - denier - per - filament as found in the low denier yarns is a must for the texturized softness. All the current processes excepting Spunize and Agilon to date are not applicable to the heavier sizes of nylon, from 840 through 4200, and these deniers are not primarily used in the apparel fields.

Perhaps during 1959 the textured filament may not necessarily be competitive but it seems logical that the growing fields of textured yarns have profited by the availability of a new tool of fabric design and that the result has been as much an over-all growth as it has been a penetration into the fields of already available fibers.

Tips for sizing filament nylon warps

■ EXPERIENCE of the Du Pont Co. with various sizes for filament nylon warps shows that polyacrylic acid gives best results, a recently published bulletin (designated N-103) indicates.

However, this nylon producer points out that the acidic nature of aqueous solutions of this size requires special, corrosion-resistant slashing equipment. In mills where such equipment is not available, use of polyvinyl alcohol size (a non-acidic size) is recommended.

Following are some suggestions offered for applying these materials to filament nylon warp yarns:

Sizing with Polyacrylic Acid (PAA). The acidic nature of PAA size makes it incompatible with many common size materials, with most quaternary ammonium salts, and with some emulsifying agents. Mixing with any of these materials may cause a rubber-like precipitate to form. This precipitate can clog the pipe lines, contaminate the size solution and adversely affect the adhesion of the size to the yarn.

The sizing kettles, lines, and size box should be thoroughly cleaned with a solution of soda ash both before and after a changeover to PAA size to minimize the possibility of contamination. Filtering the size solution before filling the size box will prevent any foreign materials from affecting slashing or weaving performance. The filter should be watched carefully before and after a changeover to PAA to avoid any possibility of clogging and overflowing.

The following is a typical PAA formula for a 104 sley, 70-34-7Z-200 warp to be used in a taffeta fabric:

Polyacrylic acid	
(25% solution	115 lb (approx. 12 gal)
or (30% solution)	95 lb (approx. 10 gal)
"Nopcolube" 55	25-50 lb
Water	to make 100 gal

Slashing conditions for the above formula are usually adjusted to give a PAA pick-up of 1 to 3% (a method of determining PAA pick-up is given in the bulletin).

Adjustment of the size pick-up and of the formula may be necessary to accommodate the particular fabric construction and weaving conditions of individual mills.

NOTE: Use of "Nopcolube" 55 (a product of Nopco Chemical Co.) is optional. This size additive is used principally as a "softener" or as a substitute for afterwaxing.

Sizing with Polyvinyl Alcohol (PVA). Polyvinyl alcohol sizes, such as "Elvanol",* exhibit less adhesion to "raw" nylon than PAA sizes, but when properly formulated and applied, should not result in excessive shedding of the size on the loom. Shedding can be kept to a minimum by the use of "Colloids" 287** in the size formula.

As previously mentioned, PVA sizes are non-acidic and can be applied from conventional sizing equipment.

Contamination of PVA size can be prevented by avoiding exposure to borax or borated dextrins that are incompatible with PVA, by thoroughly cleaning all lines and kettles with steam or hot water, and by filtering the size solution before filling the size box.

The following size formula will serve as a good starting point when preparing "Elvanol" polyvinyl alcohol for use on a 104 sley, 70-34-7Z-200 warp for a taffeta fabric:

"Elvanol" 51-05	
polyvinyl alcohol	80-100 lb
"Colloids" 287	5-10 lb
Sorbitol	
(Sorbo grade)***	3½-7 lb
Water	to make 100 gal

NOTE: Soft water (under 25 ppm hardness) must be used when "Colloids" 287 is included in the size formula.

*Polyvinyl alcohol size manufactured and marketed by Vinyl Product Div., Electrochemicals Dept., E. I. du Pont de Nemours & Co., Inc.
**A product of Colloids, Inc.
***A product of Atlas Powder Co., Industrial Chemicals Dept.

Slashing Conditions. Slashing conditions for PAA and PVA sized nylon warps are as follows:

Speed	24-30 ypm
Stretch	Zero (with positive tension on the warp)
Size box temperature	
for PAA size	110-140 F
for PVA size	135-150 F
Immersion roll position	Half to fully immersed
Quetsch roll	
surface hardness	65-70 Shore Durometer units
pressure	1200-1800 lb
cover or boot	none
Slasher can temperatures	160, 180, 195, 195, 195, 170, and 140 F
cover or boots	none

The braking force applied to the section beams in the slasher creel should be balanced to insure uniformity of tension from end-to-end of yarn on the loom beam.

Initial adjustment of the quetsch roll pressure should be such as to permit a clean split of the warp sheet well ahead of the first "split" rod at the front of the slasher. Subsequent adjustments should be based on the size pick-up and weaving performance of the warp yarn. Quetsch rolls softer than those specified above will require higher roll pressures.

Covers or boots should not be used on the quetsch roll or slasher cans since they tend to become coated with size and adversely affect the quality of the sized warps. A coating of "Teflon" on the first two or three cans is recommended to reduce sticking of the sized yarn to the cans and to prevent size build-up on the cans.

Oil or wax is sometimes applied to the warp at the front of the slasher to lubricate the sized yarn and to reduce static. They are usually applied by means of a variable-speed contact roll. Static eliminators may also be used to minimize static on the warp sheet being wound on the loom beam.

Red cans, white sliver, and black and green machinery form colorful "tunnels" of spinners' alleys. Lois Hicks moves a clearer.

No slubbers allowed!

Sliver-to-yarn spinning, as old as textiles in some respects, is writing a new chapter in yarn manufacture. This operation runs fast and well.

Staff prepared Exclusive

ALTHOUGH Rockford Mfg. Co., Rockford, Tenn., was already equipped with 1949-model, 4½" gauge spinning frames, the economics of spinning 2's to 8's waste yarns pointed dramatically to the advantages that recent advances in spinning from sliver could offer. As a result, the 1949 frames were set aside (a few were retained for spinning knitting yarns) and 15 Gwaltney SG-3C frames were installed to spin directly from 55-grain, single process drawing sliver. The drafting element is a four-roll, two-apron system.

Operating 120 hours weekly, the 240-spindle frames, serviced each shift by three spinners, two doffers, and one section man, produce up to 80,000 pounds of coarse yarns in that period. On that schedule, a single frame has produced as much as 18,000 pounds of 3's yarn.

The actual production from week to week, of course, is related to the average yarn count and the numerous other variables incidental to cotton textile production.

Compared to the original operation, except in the number of frames involved — formerly there were 33 for the same production— the scene is king-size. This comparison extends to all the little pieces that make up the final picture.

Yarn counts of 2's, 3's, and 6's are spun on 3½" rings (these frames too are 4½" gauge), and each bobbin is large enough for a 12¼" traverse. The 8's yarn is spun on 3" rings. In the case of 2's yarn, the net bobbin weight is 1.125 pounds, and each such bobbin is filled at the rate of 0.4886 pounds per hour (based on 85% efficiency).

The front roll speed on 2's is 200 rpm; on 3's, 200; on 6's 197; and on 8's, 198. One drawing can supplies two spindles from

Block creeled, undisturbed by blowers, the sliver is within easy reach of all. In post alleys, walking room is left between creels.

its 30-pound load of twin slivers. Doffers wheel oversize boxes, the 55-gallon drums sometimes used for large-package doffing being too small.

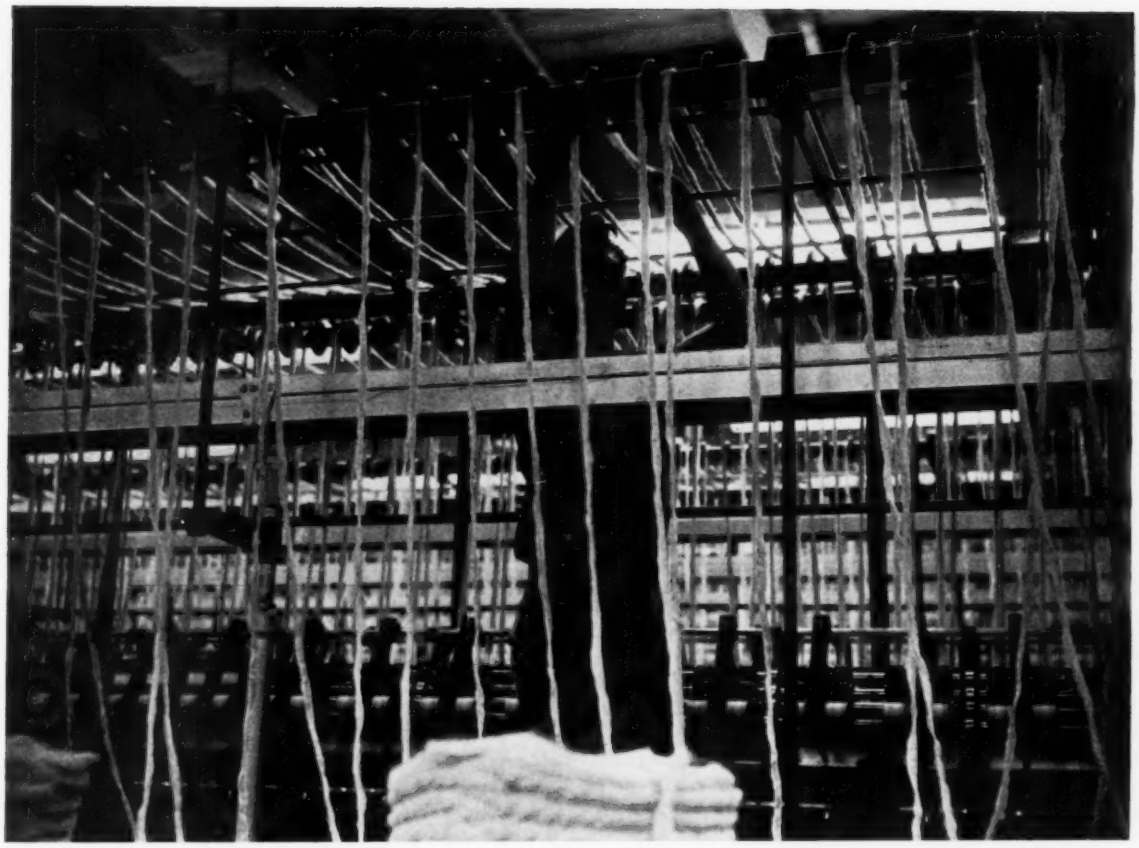
The 15" cans in the spinning creels are supplied from 12 deliveries of Versamatic Twinstrand four-over-five drawing. The drawing formerly required totalled 59 deliveries.

Each spinner patrols her ten sides, piecing up only those ends which do not involve broken sliver which has slipped out of reach. The creeler with his low step ladder threads up the sliver from the cans, whether it is a new creel or a broken end which requires passing over the lifting rolls. He moves the sliver from the card room on a cart holding 10 of the 15" cans.

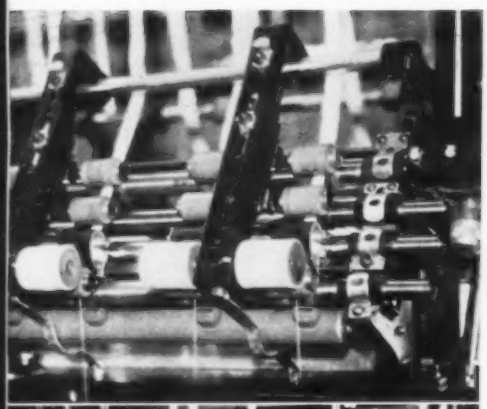
Except for scavenger rolls on the front top line, clearers are not used except for a single clearer section assigned to each frame side. This section is moved along the frame as needed. Suction cleaning picks up and whisks away the front roll waste.

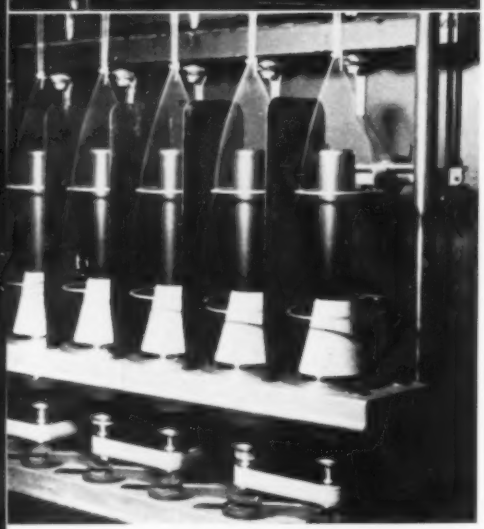
The spinning room is supplied with washed air from a central station. Although this acts as a combination temperature and humidity control, the mangement is eyeing deep-well water supply as a further aid in lowering the temperature. In cool weather it was

The 12 deliveries of drawings are supplied with 18" x 42" cans from the cards in the background. Elmer Hunt reaches upward to splice an end in one of the big 10-end-up-creels.



The height of the lifting rolls, the presence of so many sliver cans, plus several other factors, led management to adopt a job classification new to its organization—spinning creeler. The one shown here, Clyde Myers, Jr., with a low step ladder to permit him to reach the creel top with ease and safety, is passing an end around the lifting rolls. He transports the cans, places them in position, and pieces up the ends that fall back out of reach of the spinners. Cans are moved, ten at a time, on a special cart.





The sliver drafting system and the large packages with node control rings aid in building the large production figures. Ends-down experience is good. Below is a side view of the group of fifteen units.

Six-foot extended aprons on feeders keep feed variations from high to low level near 5%.

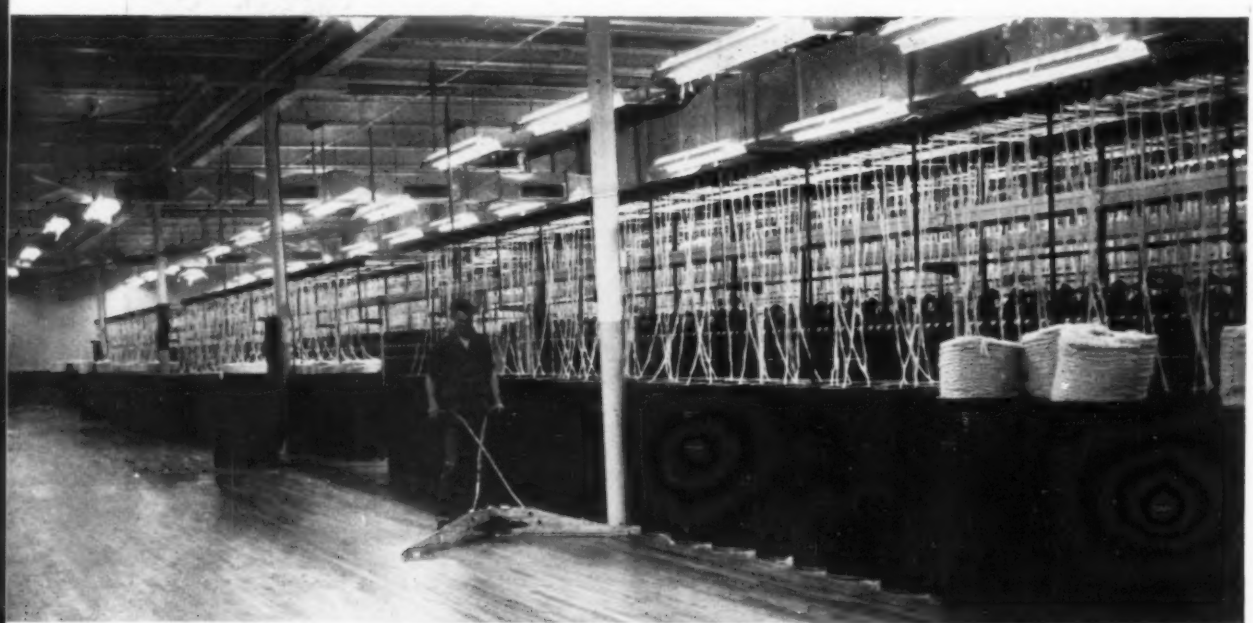
noted that the naturally lower inside temperatures brought more comfort to the personnel, better running work, and less fly. The relative humidity is maintained at approximately 50 per cent.

Rockford's management is quick to point out that sliver-to-yarn spinning can be successful only if the stock is prepared properly. And "properly" includes blending. One of the opening room changes made in preparation for the system was the addition of six-foot extended aprons to each blending feeder.

The aprons assist in keeping the feeders loaded at a fairly constant level, and in doing so they aid in minimizing irregular output. This irregularity in feeding, which had been checked as high as 30 per cent in pre-apron days, is now approximately five per cent from low level to high level. Automatically controlled, the aprons start and stop on command from the feeders.

Metallic clothing was installed on the cards, which also were equipped with individual drives and anti-friction coilers for the 18″ x 42″ cans. A lap conveyor system was installed for moving the laps from picking to carding.

As part of the changeover, the firm erected a new room for housing the carding, drawing, and spinning. The floors in this annex were made sound enough to support closer card settings, and the roof was raised high enough to accommodate the higher frames with ease.



Here's a simple but effective

Supply control system

Careful study and meticulous planning produced this method used at Erwin Mills

by John McArthur
Controller, Erwin Mills

Exclusive

The system starts with the preparation on an Addressograph machine (left photo) of a ticket for each item in stock (see Fig. 1 at top of next page). Numbered in sequence and filed in groups according to item in the tub file (center photo), the tickets are removed as parts are withdrawn from stock. When issuing a part, the clerk removes the ticket bearing the highest number from the appropriate group in the tub file, reads from it the bin number, goes to the bin and withdraws the item (right photo). While there he adjusts the bin card file to reflect the new total (see Fig. 3 on page 121 for explanation of bin card system).

SEVERAL years ago our management asked for a supply room system that would assure the proper quantity on hand at all times, furnish the mill a simple means for requisitioning items, allow the supply room clerk to easily find and issue the stock, give dollar value usage reports to appropriate groups, and provide for an accurate perpetual inventory utilizing independent receiving. As usual, the request was for a simple system that did not require the use of mill-trained or experienced supply room clerks.

Our supply rooms are responsible for all supply and repair parts, and include all items except direct materials such as cotton, dyes and chemicals, boxing, fuel, etc. Our first thought was to visit a number of friendly neighbors to determine the methods they were using.

We found a number of excellent systems in operation but none that we felt were designed for our particular requirements. From each system, however, we were able to get some information which we eventually used in our application.

We had a number of supply rooms that had been operating for quite a few years. No two were set up alike, but each had certain desirable features.

It was necessary to do certain work before any type of system which we might decide upon would prove to be successful. This included rearranging the items in the bins so that each bin contained only one type of item, with the bulky items in the larger bins, the smaller items in the small bins, etc.

The bin locations showing section, row, and bin number were noted. By consulting the mill supervisors, a determination was made of the minimum quantity of each item to have on hand before reordering, the maximum quantity to have on hand after ordering, with the resulting quantity to be periodically ordered being the difference between the two.

It was also necessary to determine the number of items to the issue; for example, wood screws of a given size would be issued in dozens and not in singles. Some items were set up to be issued in gross, some in hundreds, others in thousands, etc. All of this was necessary regardless of the kind of supply room system we might ultimately have.

Upon inquiry we found that practically all mill parts bear part numbers embossed on them. If the old part were turned in to the supply room the number of the replacement part desired would be automatic, and the old part could act as a requisition for the replacement part. By setting the old part aside for a review by the mill supervisor, we could be assured that the replacement part was needed, and that if the old part could be repaired for reuse this would be done.

Parts that had no part number could be indexed alphabetically by sizes; for example, wood screws. Parts that had a number but the old part was defaced or mutilated so the number could not be read, could

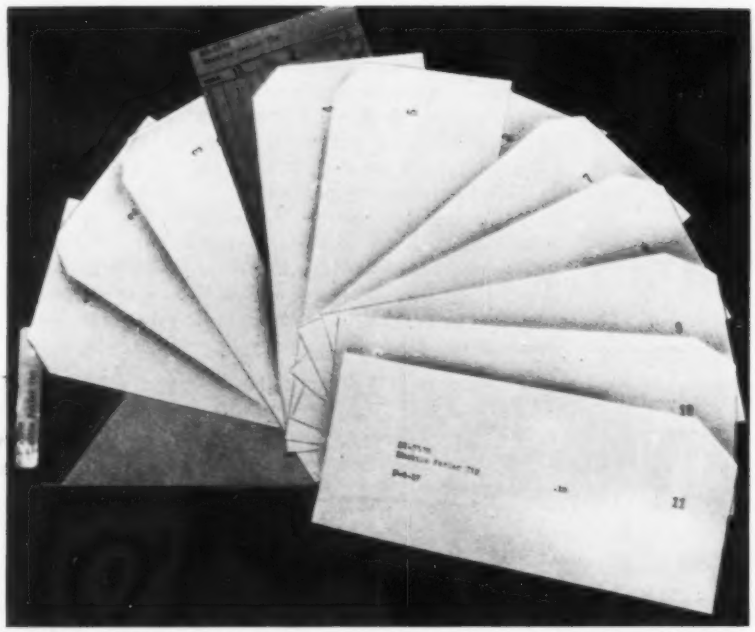


FIGURE 1. There were 11 shuttle feeler tips on hand in the supply room when this group of tickets was withdrawn from the tub file (center photo on page 119) to be photographed for illustrating this article (note the number 11 at the extreme right on the top ticket). Printed on each ticket are the part number, bin number, item name, price per unit, and a serial number. Note the card between Tickets 3 and 4. Red in color, it signals the supply clerk that it is time to reorder the item. That is, when Ticket 4 is removed from the file, the red card comes into view to remind the clerk to reorder. He withdraws the card from the file, places the order for the item, and returns the card to the same place in the file when the stock is replenished. The card shows that shuttle feeler tips are ordered nine at a time, that the maximum to be kept on hand is 12, and that the minimum is three.

be found in the manufacturers' catalogs kept in the supply room.

We then decided upon a system which employed the use of Addressograph equipment, one version of which we had seen in operation in another mill.

Each item in stock is represented by a ticket (Figure 1) giving the part number, description, current price, and bin location. All of the information is repeated on each ticket.

The tickets are numbered consecutively, beginning with the largest number on top. When an issue is made for the item shown in Figure 1, the top ticket is removed, and the quantity on hand then becomes 10 (12 is the maximum for this item). The ticket directs the supply room clerk to the proper section, row, and bin, to obtain the part which he issues.

Then the clerk files the issue ticket in the desired manner for subsequent summarizing and reporting of dollar value of parts issued to each unit.

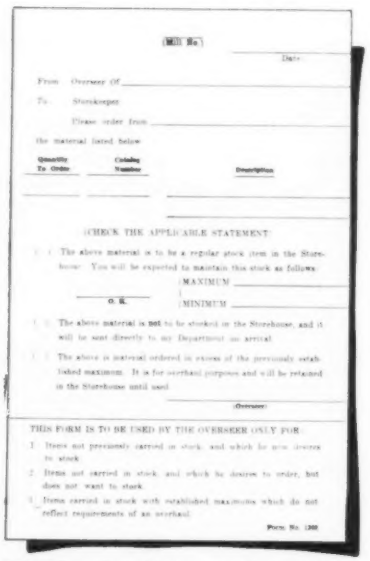
When ticket No. 4 is issued, the red minimum and maximum card acts as a flag which is pulled out of the tub file. Then a purchase requisition is issued for the number of the items to be bought. The red card is returned to the tub file when the items ordered are received.

As replacement items are received to be placed into stock, the clerk fills out an independent receiving record (which is forwarded to our accounting department), places the parts in the proper bins, after verifying the count of items in the bin with the tub file tickets, and makes up tickets which are consecutively numbered—the bottom ticket being the next number in the sequence.

Occasionally, the mill desires to add items which are to be maintained in stock with a certain minimum and maximum quantity order (special items which are not stocked in the supply room) and to order special items in excess of normal requirements. This is accomplished by having the mill fill out the special order form for this purpose (Figure 2). When these special orders are received the parts are sent directly to the department originating the special order, and the cost is charged to that department.

There are times when for one reason or another it seems wise to carry a smaller or larger quantity on hand. It is a simple matter to change the position of the red minimum and maximum card, noting on it the adjusted minimum and maximum quantities. For example, the item in Figure 1 can be changed to a minimum of 6 and a maximum of 18 by so noting on the minimum and maximum card and filing it between issue tickets 7 and 6. Since the minimum and maximum quantities for each item are determined by the mill supervisor who is responsible for their adequacy, the matter of maintaining those quantities becomes a clerical task.

In the event the need for certain items is eliminated or in the event the quantity on hand seems to be far in excess of foreseeable needs, the clerk reports this information to the purchasing agent so



(Mill No.) Date

From: Overseer Of

To: Storekeeper

Please order from

the material listed below

Quantity To Order | Catalog Number | Description

(CHECK THE APPLICABLE STATEMENT)

( ) The above material is to be a regular stock item in the Storehouse. You will be expected to maintain this stock as follows:

O. K. | MAXIMUM | MINIMUM

( ) The above material is not to be stocked in the Storehouse, and it will be sent directly to my Department on arrival.

( ) The above is material ordered in excess of the previously established maximum. It is for overhaul purposes and will be retained in the Storehouse until used.

Overseer

THIS FORM IS TO BE USED BY THE OVERSEER ONLY FOR:

1. Items not previously carried in stock, and which he now desires to stock.
2. Items not carried in stock, and which he desires to order, but does not want to stock.
3. Items carried in stock with established maximums which do not reflect requirements of an overhaul.

Form No. 1200

FIGURE 2. To add items to be maintained in stock, and to order items in excess of normal requirements, each plant executes this form and places it with purchasing. When received, the items are charged to and shipped directly to the department which originated the order.

FIGURE 3. On each bin is one of these metal card holders (see right photo on page 119) with several cards of different color reflecting essentially the same information contained on the tickets in the tub file. As a check against the tub file record, the items in each bin are counted periodically. Each supply clerk checks the content of a prescribed number of bins daily, enters the count on the back of the bin card (top card in this photo shows back), and places the card behind the others. Thus, the color of the exposed card indicates the progress of the bin count.

that other mills can draw from this excess stock, or the excess stock may be disposed of.

Individual item prices are only changed when they have varied a certain percentage in price. When this occurs, the supply room clerk posts the new price on all the tickets on hand for that item and notifies the accounting department so that a journal entry may be prepared adjusting the supply room account by the dollar value difference.

No system will work properly unless there is reasonable accuracy between the actual number of items in each bin and the perpetual inventory as shown by the tickets in the tub file. This is accomplished by having the clerk count the items in a designated number of bins each day and noting the count on the back of the bin cards (Figure 3), adjusting the tub file tickets for any difference. The top bin card is then placed on the bottom, which changes the color of the bin card and enables the clerk at a glance to determine which bins have been counted during that particular quarter or other period during which all bins should be counted.

At the end of any quarter or at any other date, an accurate inventory of the supply room can be taken from the tub file tickets. In our case, we mark the quantities on a set of tabulating cards which have already been punched with all other information, and from these we obtain a listing of each item in the inventory showing quantity, price, and amount (see Figure 4).

The system we adopted was not primarily designed to reduce supply room personnel, but it did result in some reduction. The biggest manhour reduction came in the lesser time required of the mill employee to get needed parts. He does not have to create any written document, does not have to find his supervisor to obtain approval, and has only to wait a minimum length of time to receive the items desired.

In summary, we feel that with the system we accomplish to some extent these objectives:

1. *Assure the proper quantity on hand at all times.* The mill supervisors have determined the minimum and maximum to be carried on each item; they also make requests for items not normally stocked to be used on nonrecurring jobs. If the supply room clerk orders the items properly (when minimum and maximum card has been reached, or when special or-

(Continued on page 133)

	L - 10650		
82	DRAG ROLL SPRING	09	7 38
	LM - 10651		
40	WING NUTS	15	6 00
	L - 11062 KB		
2	RH LOOM SIDE	18 73	37 46
	LM - 11837		
8	LET OFF FRICTION CAM	19	1 52
	LM - 12601		
44	TAKE UP PAWL SPRING	14	6 16
	LM - 13862 CHECK NUT		
31	1-2 X 7-8 X 5/16	68	21 08
	5-16 X 1-2 L/14958		
1278	CAP SCREW	02	25 56
	LM - 14045 WASHER		
19	1 9-64 X 1 3/4 X 109	03	57
	L - 15487 1-2 X 2 1/2		
180	R POINT SET SCREW	08	14 40
	L - 17008		
2	SELVAGE BRACKET	84	1 68
	L - 18701		
10	SHAFT TREADLE SHAFT	23	2 30
	LM - 20095		
91	BINDER RIVET WASHER	03	2 73
	L - 20512		
11	TAPE SELVAGE CAM	68	7 48
	L - 20842		
6	SELVAGE TREADLE STUD	09	54
	LM - 21248		
353	HARNESS WIRE	06	21 18
	LM - 23054 FILLING		
12	CAM FOLLOWER BUSHING	17	2 04
	LM - 25127		
19	CAM SHAFT KEY	08	1 52
	LM - 26032		
149	PINION KEY	02	2 98
	LM - 26643		
15	LH AUX SHAFT NUT	26	3 90
	LM - 28956		
21	WING NUT	36	7 56
	LM - 32458		
0	DRAG ROLL HOLDER	53	00
	LM - 32775		
6	BOBBIN CHUTE SPRING	18	1 08
	L - 32917 3-8 X 1 1/4		
49	R POINT SET SCREW	03	1 47
	L - 32921 5-16 X 1 1/2		
106	R POINT SET SCREW	03	3 18
	L - 33449		
45	SELVAGE ROLL BRACKET	32	14 40
	LM 34545		
6	DOBBY CRANK AS	1 58	9 48
	LM 34682 10 30 X 1 1/2		
39	FH MCHE SCREW	02	78
	L - 35069 SELVAGE		
5	ROLL SHAFT BOTTOM	28	1 40
			205 83 *

FIGURE 4. At any chosen time an accurate inventory of the supply room can be taken from the tub file tickets. The quantities are marked on a set of tabulating cards which are already punched with all other pertinent information. From these cards is prepared this listing of each item in the inventory, showing the quantity, the price, and the amount.

Loom upkeep practices surveyed

Use this mill man's findings as a checklist for the loom maintenance program in your mill

by Carl West
Exclusive

Loom fixers inspect all parts of an assigned number of looms periodically in most of the mills.

LOOM maintenance is one of the biggest problems of a weaving mill. Like most machines, a loom will continue to operate (after a fashion) with a lot of things wrong with it.

A loom that is not functioning correctly will cause second-quality cloth. Its production will suffer, parts will be broken or prematurely worn, and it will take up a lot of both the weaver's and loom fixer's time.

Maintenance is made complex by the loom's variety of parts and motions. Many of these parts are subjected to constant strain and vibration. Also, many of the parts are made of less-durable materials such as wood, leather, metal alloys, and plastics.

Another factor that hampers loom maintenance is a human one. The weavers, most of whom are paid by piece rates, want all their looms to operate continuously. They will often force a loom to run with little faults until they become big ones. They also resent having a loom stopped for preventive maintenance or check-up.

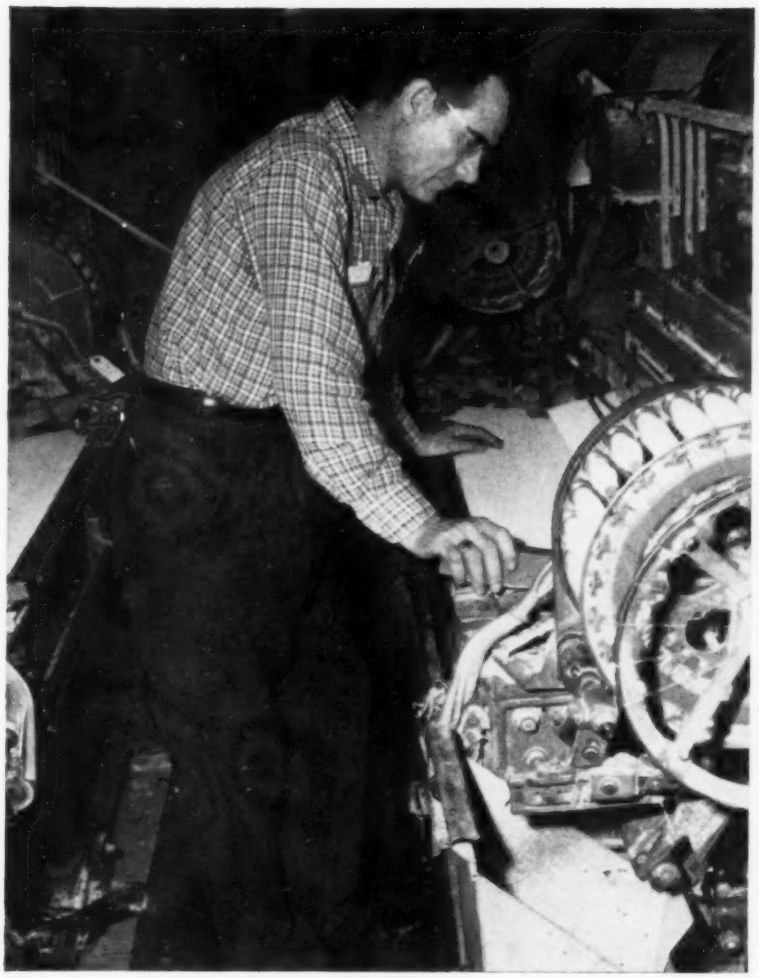
Most loom fixers are content to let a loom limp along until shift change in the hope that the loom fixer on the next shift will fix it. This kind of buck-passing will sometimes continue until a loom is in such worn-out condition that it will have to be almost completely rebuilt.

It has long been recognized that a system of preventive maintenance will keep a loom in good running condition, will prevent many breakdowns, and will cut downtime for repairs. The problem is in developing a system that will allocate the maintenance work fairly, that will give to each part or motion the attention it needs, and a system that can be supervised easily and adequately.

Prevalence of Programs. In a survey of a number of mills having single-shuttle looms it was found that all of them have loom maintenance programs. The programs are very similar in some ways; widely divergent in others.

All the mills are operating three shifts, and they have each section divided into three equal parts. The loom fixer on each shift has one-third of the looms on the section assigned to him for maintenance work.

Most of the mills have the looms grouped for maintenance pur-



Follow-up on maintenance and major repair jobs is made by the secondhand or overseer

poses. That is, the first third of the section, or the looms with the lowest numbers, are assigned to the first-shift loom fixer. The next third, counted off in numerical order, are assigned to the second-shift fixer, and the remainder of the looms are assigned to the third-shift fixer.

But having the looms grouped for maintenance purposes is unfair to some of the weavers. For instance, if most of the looms on a weaver's set are assigned to the first-shift loom fixer he will spend a lot of time on those looms and the first-shift weaver will lose a lot of production. The second- and third-shift weavers will benefit from the work done on the looms during the first shift but they will not lose any production because of it.

Some of the mills interviewed spread the maintenance work more evenly by assigning looms in one, two, three order and they stencil the shift number on the appropriate looms.

Records. The mills all have some form of report and most of them keep records of various maintenance chores. One method that is used extensively is to have a checklist printed on a card for loom fixers to use at warp-out.

The loomfixer goes down the list as he checks each part and makes any needed repairs and adjustments. The card is then given to the secondhand for follow-up after the new warp is started. In some of the mills the overseer or his assistant also spot-check some of the looms.

The checklist is also used in some mills for loom-to-loom checking, by the loom fixer, of the looms assigned to him for maintenance, and is used in most mills when the loom is adjusted to receive a new shuttle.

Certain parts of the loom need more frequent attention than can be given at warp-out. Most of the mills require the loom fixers to check the thread cutters, filling feelers, the shuttle boxing action, and the warp tension at the beginning of the shift.

Parts that receive weekly care are the shuttle, box plates, binders, pickers, swords, filling forks, warp stop motion, and protector motion.

Some of the mills require the loom fixers to do certain maintenance tasks on specified days. For instance, in one mill all the loom fixers go over their box plates, binders, bumpers, strapping and pickers on Monday; Tuesday they check the shuttles; Wednesday, swords; Thursday, take-up and let-off motions; Friday, filling forks, warp stop-motions, and protector motions.

In other mills it is left to the discretion of the loom fixer when, and in which order, he does his

Most mills have fixer use a checklist.

LOOM INSPECTION

Loom No. _____ Sec. No. _____
Shift _____ Date _____

Shuttle _____
Pickers _____
Front Boxes _____
Binders _____
Crank Arms _____
Swords _____
Brake _____
Shipper _____
Picking Motion _____
Filling Transfer _____
Thread Cutters _____
Temples _____
Take-up _____
Let-Off _____
Harness _____

Loomfixer _____
Foreman _____

TEXTILE CHEMICALS FROM DOW

Dow Latex backs carpeting with a strong "hand"

Dow Latex 529K backs up carpeting with features that clinch sales. Used in back-sizing, this high-styrene latex is unmatched for imparting a firm hand that bespeaks quality and durability. And along with this improved stiffening goes firmer anchorage of loops in tufted carpeting. Dow Latex 529K has outstanding fadeometer stability and provides backings with light color and resistance to discoloration . . . extra selling features for every unit of latex used!

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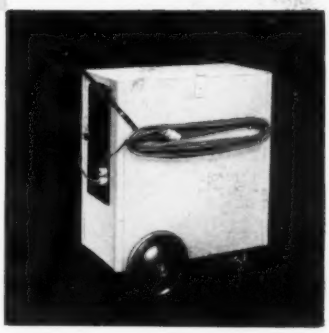
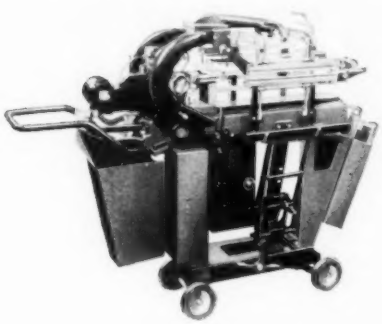
BARBER-COLMAN

SERIES "M" MODELS NOW MADE IN **10** SIZES
FROM 36" TO 126" BY 10" VARIATIONS

PORTABLE *Warp-Tying Machines* FOR ALL PURPOSES

The BARBER-COLMAN line of warp-tying machines has now been extended to cover practically every conceivable application. As noted above, the Type "M" machines are now available in *ten* sizes. These machines tie the *full width* of the warp in one operation, work directly in back of the loom, and are made in several types to tie-in cotton, spun yarns, filaments, wool, worsteds, or synthetic yarns from a flat sheet or from an end-and-end lease. When using a Type "M" Warp-Tying Machine, none of the weaving elements need be removed nor any of the loom settings disturbed. The picture at the right shows the special cart used for protecting the Knotter Unit when not in use and for carrying it from one frame to another when two or more are employed. This carrier also contains the variable speed-controller for the Knotter Unit. These machines are probably the most versatile available for most mill conditions.





IMPROVED SERIES "L" MODELS IDEAL FOR CERTAIN CONDITIONS

BARBER-COLMAN Model "L" machines are familiar to two generations or more of mill people, because they have been on the scene in one form or another for 45 years. The latest designs, one of which is shown here, have many up-to-date improvements which distinguish not only their appearance but also their operation and efficiency. These compact, versatile, and easily-moved machines have many important applications in both large and small mills. Barber-Colman representatives are thoroughly versed in the usefulness and applicability of both Model "L" and Model "M" machines, and can be consulted with confidence as to which might suit a given situation best. Also, it is important to know that all users of Barber-Colman machines are served promptly and skilfully by an alert service group of wide experience.

AUTOMATIC SPOOLERS • SUPER-SPEED WARPERS • WARP TYING MACHINES • WARP DRAWING MACHINES

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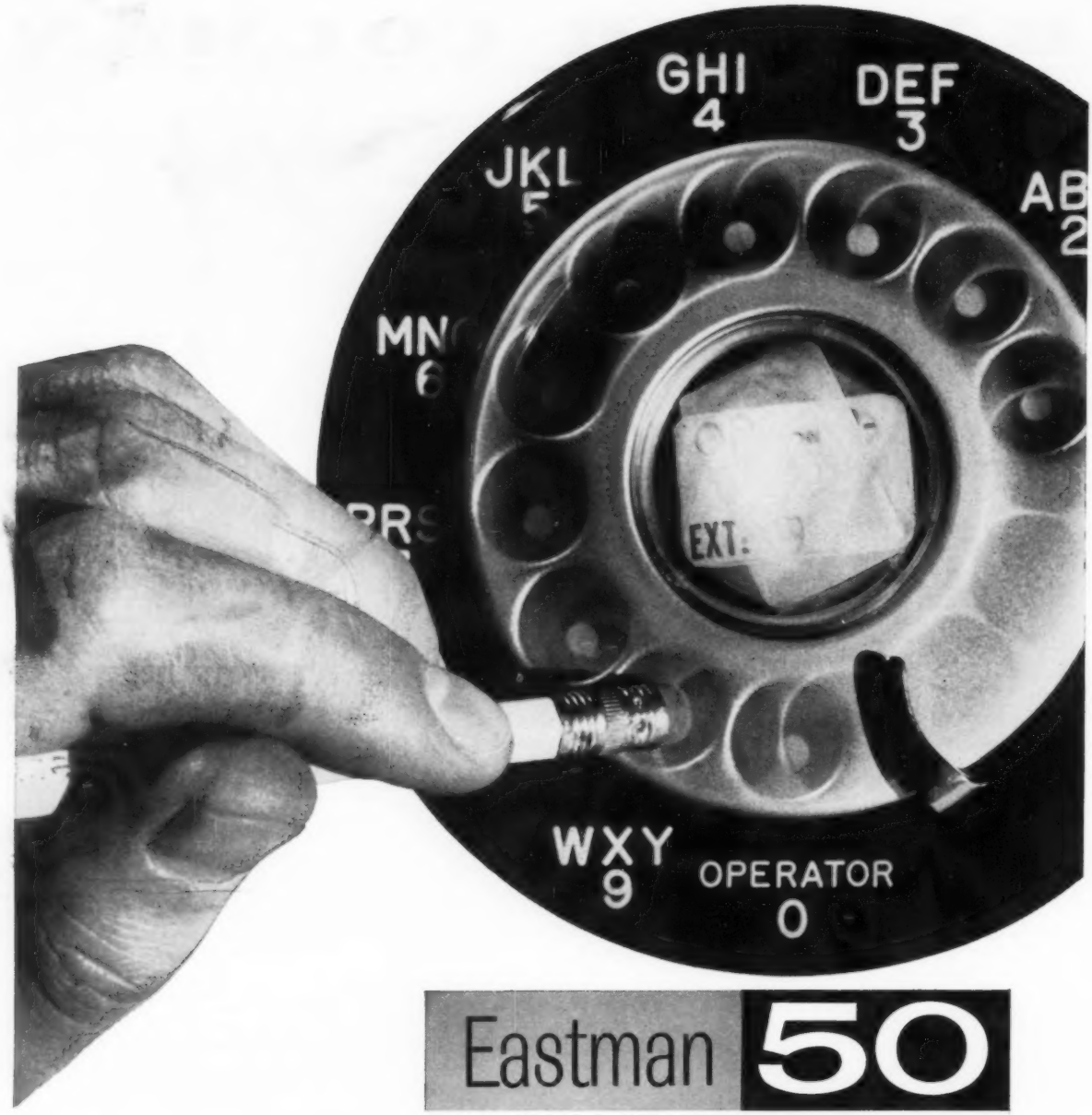


Eastman 50

THE NEW IMPROVED ACETATE YARN

A busy number with mills and converters

Here's why. A warp of Eastman 50 adds new luxury to drapery fabrics. Try it and see. There's a fuller, richer look, a new lushness and drapability. One reason is the added covering power of Eastman's improved acetate yarn. And, of course, an acetate warp gives better dimensional stability... no changes in length with changes in humidity when Eastman 50 is on the job.

Available in bright and dull luster and in Chromspun® black... same deniers, twists, put-ups and price as regular acetate yarns. Ask your nearest Eastman representative.

EASTMAN CHEMICAL PRODUCTS, INC., SUBSIDIARY OF EASTMAN KODAK COMPANY, 260 MADISON AVENUE, NEW YORK 16, N.Y.

maintenance chores. Mills that use the daily assignment method claim that the work will be done more uniformly, will be spread evenly over the week, and that the supervisors can follow up better to see that all the work is done correctly and consistently.

Others say that it is better to let the loom fixer decide when to check each part of the loom as long as he does it within a specified period of time. They say that the loom fixer can spend time on maintenance work when he does not have loom repairs to make, and he does not have to make temporary repairs just to keep up with his schedule.

In addition to loom parts that should be checked once a week or oftener, there are other parts that need attention at least every six months. These parts are the complete motions such as the take-up, let-off, battery, harness top motion and, when used, the dobby head.

To do a good job on these motions they must be completely disassembled, inspected, cleaned, worn parts replaced, lubricated, reassembled, and adjusted. Some of the mills have the loom fixers do this work in addition to their other chores; some of the mills have learner loom fixers under the direction of experienced men who do this work; and other mills have overhauling crews that go over all the looms periodically.

All the mills, regardless of their methods, agreed on one thing—loom maintenance is a never-ending job that cannot be neglected. An ailing loom not only affects the quantity and quality of its production, but it also draws attention away from other looms and they in turn begin to lose production and cause seconds through neglect.

7 per cent more man-made fiber produced last year

■ 6.34 BILLION POUNDS of man-made fiber were produced last year, the Textile Economics Bureau reported recently. This was an increase of 7 per cent over the 5.92 billion pounds produced in 1956.

The 1957 production total was made up of 2.28 billion pounds of rayon and acetate filament yarn (up 2½ per cent over 1956), 3.16 billion pounds of rayon and acetate staple and tow (up 4½ per cent), and 903 million pounds of non-cellulosic man-made fibers (up 33 per cent).

Of the 27.28 billion pounds of all textile fibers produced last year, cotton represented 66 per cent of the total, man-made fibers 23 per cent, wool 11 per cent, and silk less than 1 per cent, the Bureau pointed out. Five years ago, in 1953, cotton made up 72 per cent of the total, man-made fibers 18 per cent, wool 10 per cent, and silk a nominal amount.

Annual production capacity of all of the rayon and acetate manufacturing plants in the world (filament yarn, monofilaments, staple and tow) is currently at the level of 7.19 billion pounds, and this is slated to rise to 7.50 billion pounds by December 1959, according to the Bureau. The current operating capacity of non-cellulosic man-made fiber plants (except textile glass fiber) is 1.26 billion pounds, and this is expected to be 1.76 billion pounds late next year, an increase of 39 per cent.

Industrial expansion favored in foreign countries—Montgomery

■ REALISTIC machinery and equipment depreciation schedules permitting write-off in 10-12 years on a one-shift basis and other tax policies in Germany and other foreign countries favor expansion of textile enterprises in those countries, Walter S. Montgomery, Jr., told the South Carolina Textile Manufacturers in convention at Sea Island, Ga., recently.

In Germany machinery may be written off in from three to four years on a three-shift basis, Mr. Montgomery said, and employees are taxed on the first 45 hours per week of work, any additional work being tax-free. Other countries around the world offer inducements favorable to textile manufacturers, he continued, and mills with modern equipment and methods are blossoming in many countries having a bountiful supply of low-cost labor.

Mr. Montgomery compared Pakistan with Spartanburg, S. C., each having equal facilities, *except*:

Cotton price is 25% below the world market in Pakistan;

Six cents per hour provides a relatively high standard of living in Pakistan;

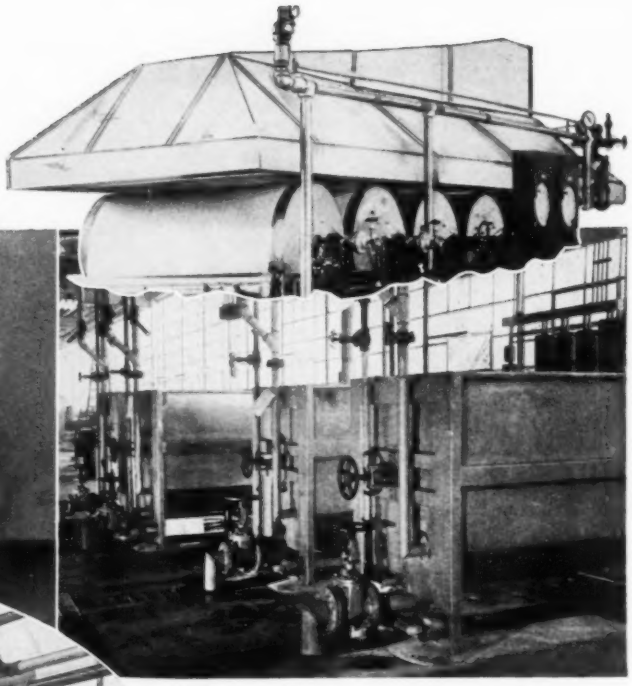
Machinery write-off is allowed in five years in Pakistan; and

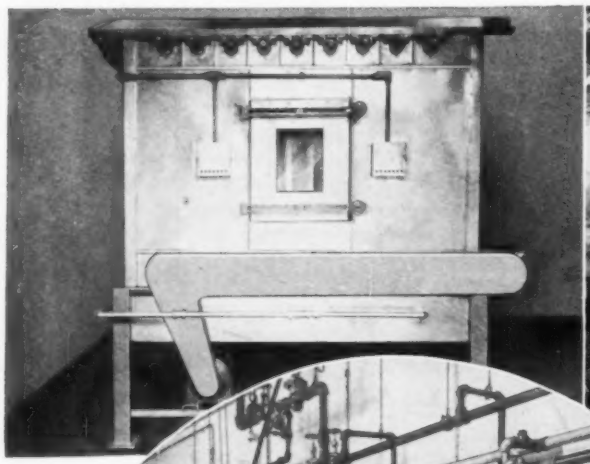
30-40% profit is the rule, with no imports allowed in Pakistan.

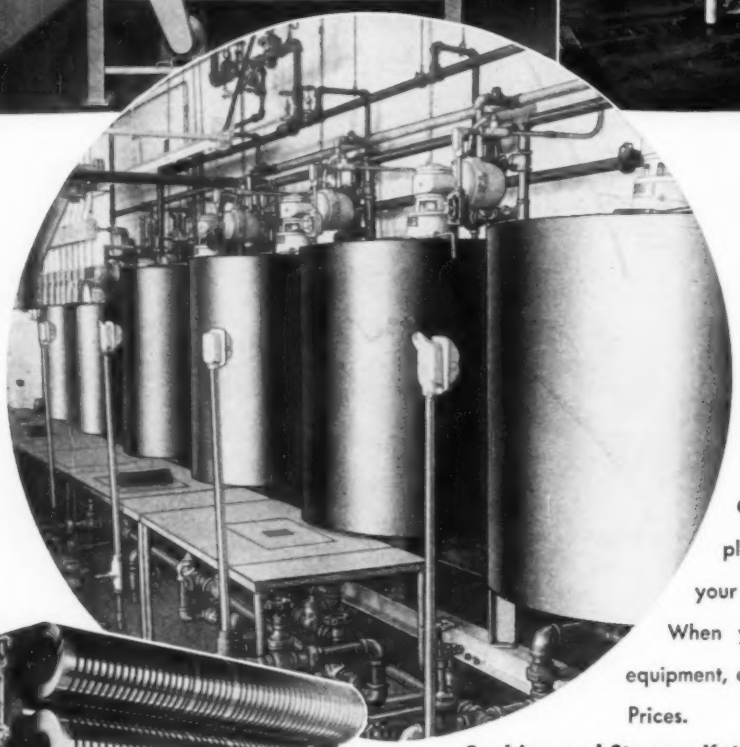
U. S. world textile trade is declining while foreign producers focus on U. S. consumers, Mr. Montgomery said. With 20-25% higher priced cotton, higher taxes, and antiquated depreciation schedules, the U. S. can look for more liquidations unless Washington policies improve, Mr. Montgomery concluded.

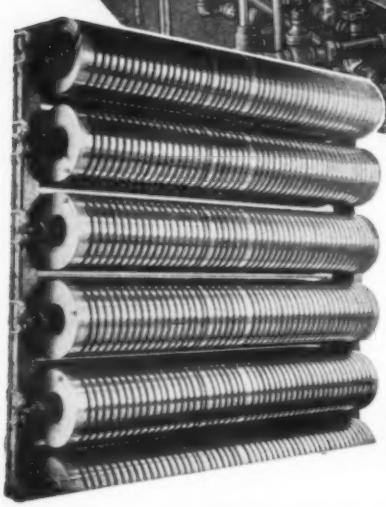
Staff photo

Cocker Engineers and Builds









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Machine and Foundry Co., Gastonia, N. C.

WORLD'S LARGEST DESIGNERS AND BUILDERS OF COMPLETE WARP PREPARATORY EQUIPMENT

INSTRUMENTS HELP OVERHAULERS

Laboratory technician Ruth Withers runs a Spectrograph test on a bobbin of roving to determine whether or not a periodic pattern has been caused by a mechanical fault. A selected sample (usually six bobbins) is run before the frame is overhauled, and after overhaul.

That's why China Grove Cotton Mills have no more machinery breakdowns caused by lack of alignment or improper lubrication

by Ashley B. Roberts
Assistant superintendent
China Grove Cotton Mills

MANY instruments available today are of considerable value in an overhauling program. Two that we have found especially beneficial are the dial micrometer and the Spectrograph.

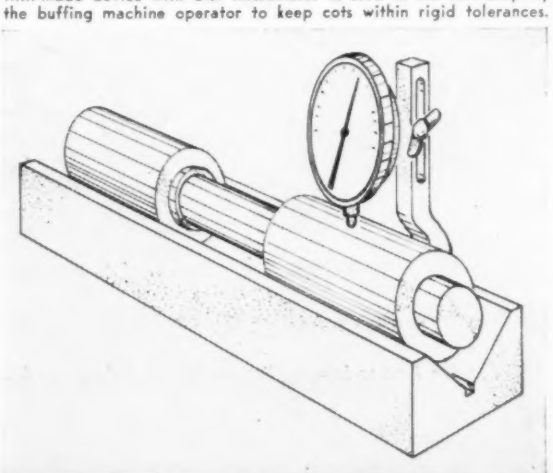
By the use of these two instruments, we are able to virtually eliminate machinery breakdowns, resulting in lost production, caused by excessive wear from improper alignment or lubrication. We check all wear points during overhaul and replace all parts that show excessive wear, thereby assuring efficient running and good quality between overhaul periods.

We use the Spectrograph as an analyzer and time-saver immediately before the machine is stopped for an overhaul. By sending samples to the lab for charts just before the machine is taken down, points of wear that are of sufficient magnitude to affect the evenness of the stock produced are pinpointed and called to the attention of the foreman for correction while the machine is down. This procedure saves both time and expense in addition to assuring correction of defective gears, studs, and rolls. A follow-up test after overhaul indicates whether or not correction of faults has been made.

A check for eccentricity with the dial micrometer is

Dial micrometer is used by section overhauler W. G. Russell at each roll stand of roving frame, to check front rolls for eccentricity.

Mill-made device with dial micrometer is used in the roll shop by the buffing machine operator to keep cots within rigid tolerances.



No. 7 in a series—how your Du Pont salesman is backed by many sales-building activities including Fiber Research, Technical Service, Fabric Development and Merchandising.

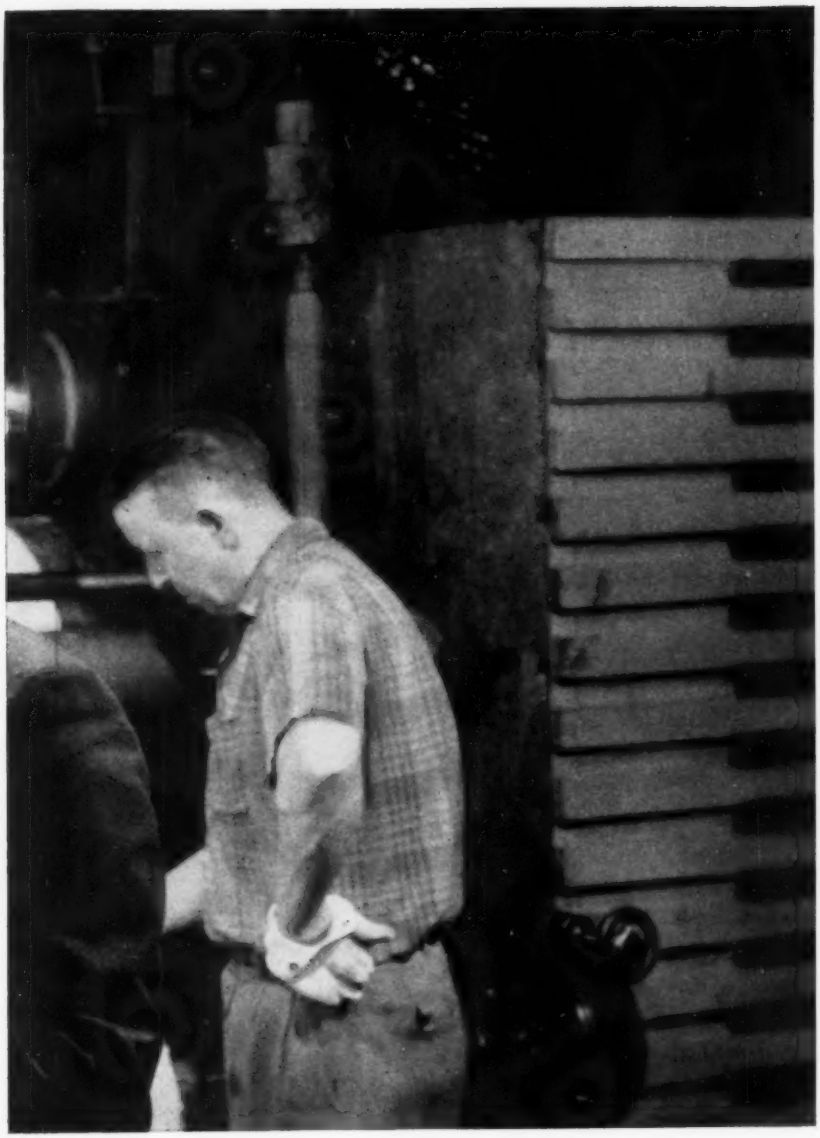
This Du Pont technician helped for finishing nylon

At left, Ralph MacIntyre, President of Joseph Bancroft & Sons Co., Inc., is seen talking with "Dutch" Sturtevant, Du Pont Technical Service representative. They're discussing a new and interesting method of finishing nylon tricot. It's a technique that may have far-reaching effects.

Developed in Du Pont's Chestnut Run Textile Research Laboratory (and made available to the tricot and lingerie industries), the process utilizes the familiar Schreiner calendering machine. Pressure and temperature adjustments are key factors.

"Dutch" played an important role in the development of this new finishing technique. He was well equipped to do so. Like many of his coworkers in Du Pont's group of 125 Technical Service men, he has a background of experience that includes intimate knowledge of specific jobs

FROM RAW FIBERS TO RETAIL SALES . . .



find a new technique tricot . . .

within the textile industry . . . the actual operation of mill machinery, for example.

This is the kind of "working know-how" that qualifies these Tech Service men to assist the industry by providing real, down-to-earth help on the processing, dyeing, finishing and use of our fibers. It's the type of assistance that the industry has found helpful whenever intricate technical problems arise.

Du Pont has always believed that the market for its fibers can best be increased by providing useful assistance to all levels of the textile industry. It's through your Du Pont salesman that you, as a customer, have ready access to a range of technical and merchandising information unique in the textile industry.

Product and Process Notes from Du Pont

Calendering Nylon Tricot—A new process for finishing nylon tricot, known as Schreiner calendering, increases covering power of tricot twofold, reduces "see-through" and eliminates extra fabric weight. A single layer of calendered tricot equals two in garments requiring double fabric shadow paneling. Heavy-knit construction used for opaque outerwear can be reduced substantially in weight, while retaining excellent covering power.

The operation consists of passing nylon tricot fabric through an engraved Schreiner calender at carefully controlled temperatures and pressures. Now, thin, lightweight fabrics can be produced with a high degree of opacity, air porosity and good bursting strength. A more effective print base can be obtained. Increased cover and the improved smoothness of calendered tricot permit a clear definition of printed patterns, allow good color register and offer more opaque backgrounds.

Detailed information about Schreiner calendering is contained in Technical Information Bulletin N-95. If you'd like a copy, write E. I. du Pont de Nemours & Co. (Inc.), Sec. I., Room 5520, Nemours Building, Wilmington 98, Delaware.

Four New Color-Sealed Acetate Shades have been developed primarily for the Fall 1958 dresswear market. These are: Empire Green, Ming Green, Sultan Red and Amberglow.

In addition, a distinct new line of colors has been assembled for the home decoration and furnishings field. Color cards, fabric color blankets and yarn samples are available through your local Du Pont Regional Sales Office.

Du Pont's No. 7 Thick and Thin Rayons, formerly produced only in deniers from 100 through 450, are now available in heavier deniers to permit broader application in home-furnishings end uses. These yarns, for example, in 900, 1800, and 2700 deniers, will impart completely new styling effects to drapery and upholstery fabrics.

Technical Information Bulletins — These Bulletins contain detailed, practical information on Du Pont product and process developments. They cover fiber properties, mill processing, dyeing, finishing and fabrication. Refer to your copies frequently; they can save you time and money. To be sure you have all the Bulletins you need—check your Du Pont salesman or Technical Service representative.

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Better Things for Better Living . . . through Chemistry

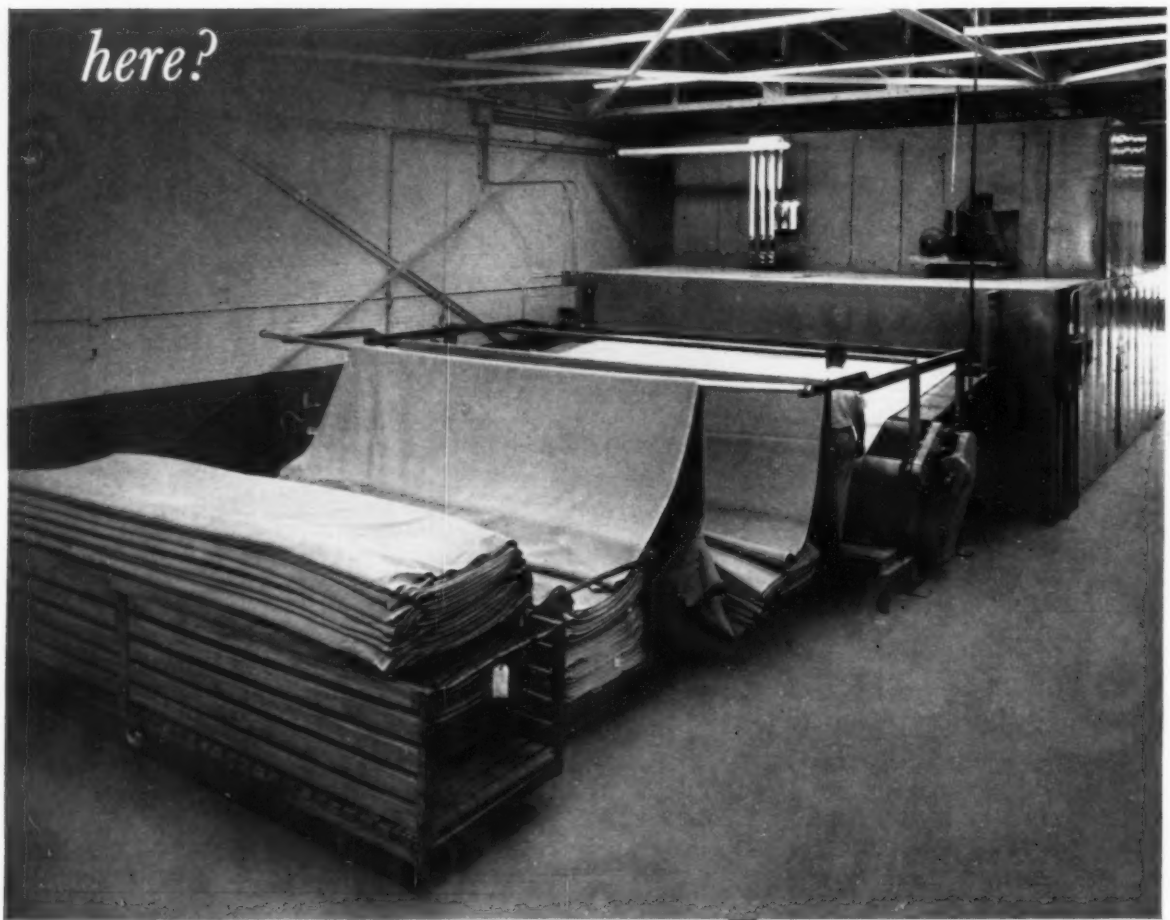
DU PONT BUILDS PROFITS FOR YOU

A custom-blended carpet backing by General Latex — that is what's going on here.

what's going on *here?*

And for this tufted carpeting manufacturer, it's like rolling on profit by the yard. Because this special fast curing compound locks loops tight; adds dimensional stability . . . is odor-free . . . lends durability . . . provides just the right "hand" . . . gives highly saleable extra quality at minimum cost.

There's a custom-blended General Latex compound that can put an end to your carpet or rug backing problems. And to serve you better and faster, there's a General Latex plant in Dalton, Georgia, in the heart of the tufted industry.



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GENERAL LATEX AND CHEMICAL CORPORATION

. . . *666 Main Street, Cambridge 39, Mass.*

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General Latex & Chemicals (Canada) Ltd. 425 River Street, Verdun, Montreal, Canada
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VULTEX

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the next test before dismantling the machine. If excessive out-of-round is found at any joint of either drafting roll, it is removed and sent to the machine shop for correction, if machine shop work is required; otherwise it is marked and straightened on the frame when the rolls are replaced after overhaul.

The dial micrometer is a standard part of each overhaul crew's equipment. It is a relatively inexpensive testing device; we use a dial calibrated in 0.0005-inch graduations, and mounted on a magnetic base. This arrangement is good for checking almost any drafting roll from drawing through spinning. It is also handy for checking calender rolls, card doffers, cylinders, and journals.

With present spinning drafts of 30 to 50, an excess of 0.003 inch out-of-round in some cases can be seen on the seriplane or in the fabric. Roll eccentricity of 0.005 inch on drawing may show in the yarn as size variation and in the fabric as bands in the case of filling. If the front roll of a roving frame is 0.005 inch out-of-round, it may not seriously affect yarn quality on double creel spinning. However, it is likely to show in single creel yarn with a draft over 30 and leave some effect on ends down and yarn strength. With screw-neck rolls and periodic use of the dial micrometer, a 0.003-inch maximum allowable eccentricity on roving should not be difficult to maintain.

HIGH TOP ROLL weights on drafting systems for these drafts require top roll buffing on a schedule of about each six months. The dial micrometer is most useful in checking both roll run-out and eccentricity. Enough cots are checked following buffing to assure good uniformity. Here 0.002 inch out-of-round and 0.003 inch run-out are maximums. We made a simple and inexpensive device for these measurements in the machine shop. The device is used in the roll shop by the buffing machine operator as the cots are buffed (see sketch).

The following is an example of the procedure we use in overhauling a roving frame. First, on the last doff from the frame, six bobbins of roving are selected—two at each end, front and back line, and two bobbins from the middle. These are selected, properly marked, and sent to the laboratory by the overseer or section man. Sliver, roving, or yarn sent to the lab for tests from a machine that is to be overhauled is given immediate attention.

Usually tests are completed within the hour. While the rolls are being checked by the overhauler with the dial micrometer, the overhaul foreman checks by the lab to get the results of the Spectrograph charts. The laboratory supervisor points out any defects that appear in the chart and, from a gearing diagram of the frame, shows possible sources of the defect.

In some instances a front roll pattern shows in only one of the bobbins. This indicates a defective top roll cot and is likely to be corrected when the cot is buffed. Back roll peak sometimes shows on each of the bobbins, indicating a worn back roll gear or keyway. These and other faults can be eliminated while the frame is down.

A follow-up check is sent to the lab from the first doff after overhaul. If further trouble is detected, the overhaulers can return to the frame for further work before they have left the area.

The following is a list of approximate overhaul schedules we have found adequate to maintain minimum down-time and good quality provided the proper departmental care is maintained.

Open and Cleaning	6 months to 1 year
Picking	6 months
Cards	5 years and up, depending upon grinding and fixing practices
Drawing	Overhaul 1 year; roll cleaning and check 3 months
Combing	Overhaul 1 year; reset-clean 3 months
Roving	Overhaul 1 year
Spinning	Roll clean and check 6 months
Twisting	6 months to 1 year
Winding	1 year

Supply control

from page 121

der has been received) there should always be the proper quantity on hand.

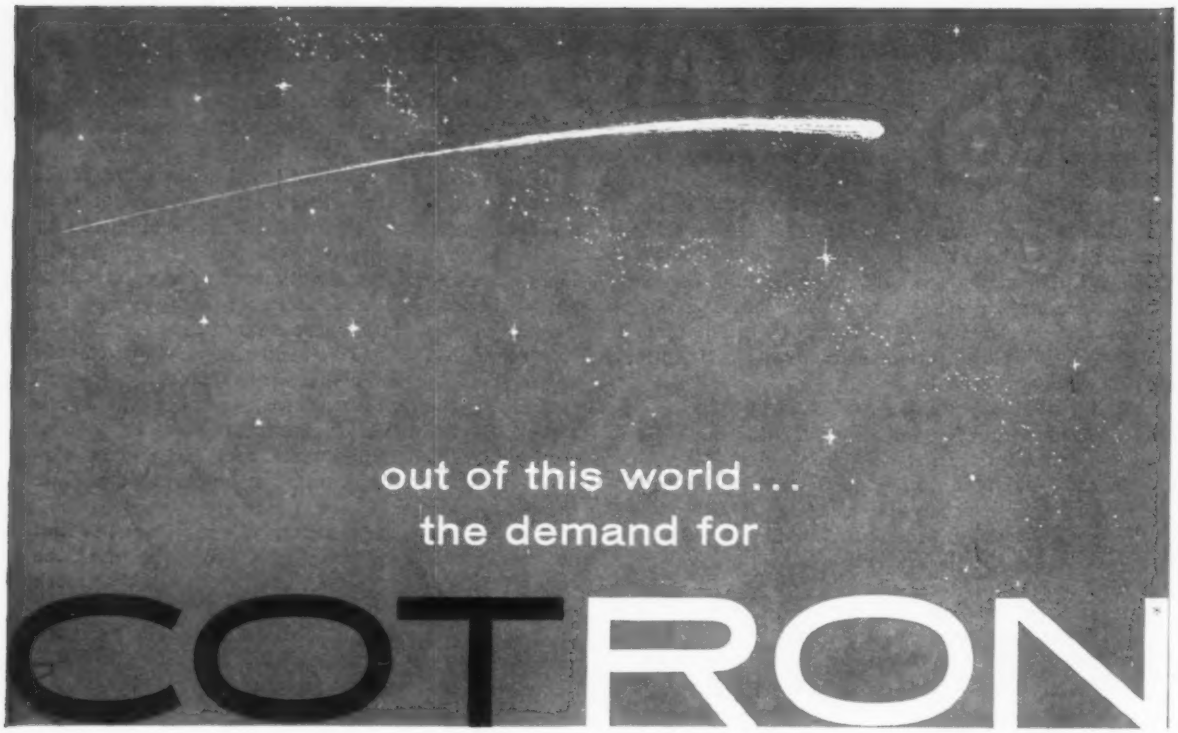
2. *Furnish the mill a simple means for requisitioning items.* Since the mill employee desiring an issue from the supply room turns in the old part, and since his supervisor periodically inspects the items turned in, it is not necessary to have any written requisition except for certain items desired to be further controlled.

3. *Allow the supply room clerk to easily find and issue the stock.* The old part turned in to the supply room usually shows the part number and it is easy for the supply room clerk to find the ticket in the tub file which gives him the exact bin location so that he can issue the part immediately and without creating any written documents.

4. *Give dollar value usage reports to appropriate groups.* The issued tub file tickets are filed by shifts, by sections, by pieces of equipment, or in any other method deemed appropriate. At the end of each month or period, the dollar value of the parts issued to each unit can be easily determined by adding the tickets.

5. *Provide for an accurate perpetual inventory utilizing independent receiving.* The tub file tickets show the quantity (ticket number) on hand of each item and this balance is maintained automatically without the use of a pencil. The bin counts made daily assure the accuracy of these quantities.

6. *Use no mill-trained personnel.* The system, as outlined, calls for the use of a clerical person with no previous mill experience. The mill employee desiring an item from the supply room can give any technical knowledge necessary to find unusual items in up-to-date catalogs secured from each manufacturer and kept in the supply room.



Investigate COTRON fabrics, the new family of fabrics made of cotton and AVISCO® rayon and you'll see the REASONS are OBVIOUS!

- Richer Lustre • More Luxurious Hand • Brighter Colors
- Better Drape • Whiter Goods • Improved Light Fastness
- Better Definition of Print Pattern

. . . and here are two more reasons—but just as important:

Resinated COTRON compared to resinated all-cotton fabrics shows

- Greater strength after repeated laundering
- Marked improvement in strength retention after repeated laundering with chlorine bleach

The American Viscose Corporation is planning big 4-color, double-spread national magazine ads, trade ads, complete department and specialty store promotions, window and in-store displays, dealer mat ads, statement inserts—*the whole works!*

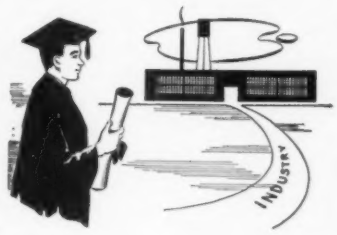
This program is fast bringing *substantial* results. People everywhere are getting to know about COTRON so well they're already asking for goods tagged with the COTRON tag. Get "on the blend wagon"—cash in on the demand for COTRON fabrics *now!*

The American Viscose Corporation is more than pleased to make available to you its Technical & Textile Service Department's vast store of information, experience and know-how regarding COTRON. A trained, highly competent technical representative is at hand at all times, ready to assist you with any COTRON fabric applications.

*Trademark of American Viscose Corporation for a fabric of cotton and AVISCO® rayon.

AMERICAN VISCOSE CORPORATION
350 Fifth Avenue, New York 1, N. Y.

AVISCO®



Welcome to America's textile manufacturing and associated industries,

1958 TEXTILE SCHOOL GRADS

■ HERE is a list of the graduates of the 1958 classes of 11 of America's textile schools.

Names of firms by which they have been employed appear immediately after the graduates' names if this was known at the time the information was compiled for TEXTILE INDUSTRIES by the schools.

The word "Military" after a person's name indicates that he elected to begin active service with one of the armed forces immediately after graduation.

Congratulations and best wishes to all of you!

SCHOOL OF TEXTILE TECHNOLOGY ALABAMA POLYTECHNIC INSTITUTE

Gerald Allen
Charles E. Bailey, West Point Mfg. Co.
Milton P. Brown, Callaway Mills
Robert W. Bugg, Jr., Deering-Milliken Co.
Dwight L. Carlisle, Russell Mfg. Co.
Jack B. Colquitt, Koppers, Chemical & Dyestuff Div.
Heflin O. Duffey, West Point Mfg. Co.
William F. English, National Aniline
Billy H. Gamble, Callaway Mills
Clifford L. Hall, Jr., National Aniline (Fiber Div.)
David M. Hall, Military
Clyde B. Hinton, Callaway Mills
Simon J. Hobbs, Tennessee Eastman Co.
Douglas G. Hodnett, West Point Mfg. Co.
James D. Howell, Haleyville Textile Mills
Clarence J. Hyche, Avondale Mills
Fred W. Keeney, Military
Sung W. Lee, Graduate work at N. C. State
Rupert A. McDaniel, Callaway Mills
Bobby W. Morgan, West Point Mfg. Co.
Tyler C. Morgan, Callaway Mills
Joseph P. Pilkington, West Point Mfg. Co.
Jamie E. Price, Avondale Mills
Jimmy L. Rogers, B. F. Goodrich
Walter N. Roselle, Avondale Mills
Robert P. Scroggins, Deering-Milliken Co.
Milner W. Smith, Military
George Toedte, Factory Insurance Association
William M. Walters, West Point Mfg. Co.
Frank M. Williamson, Callaway Mills

BRADFORD DURFEE COLLEGE OF TECHNOLOGY

Mahboob Alam
William B. Astle, Jr.
Philip S. Cuttle, U. S. Army
Ronald A. Lavoie, Berkshire-Hathaway Corp.
Rene J. Marois, Jr.
Raymond Medeiros
John L. Mercer
Albert M. Mikuski, Berkshire-Hathaway Corp.
Henry C. Ouellette
Francis J. Petrone, Jr., Graduate School, Brown University
Thomas F. Rapoza, Naval Aviation Cadet
John H. Roberts
Leonel R. Santos, Deering-Milliken
Daniel F. Scully, Graduate School
Angelo A. Stavros
Vilma Sau-Gee Zai, Hong Kong
Frank R. Zappulla

CLEMSON AGRICULTURAL COLLEGE, SCHOOL OF TEXTILES

William J. Allred, Deering-Milliken Research
Robert E. Black, Drayton Manufacturing Company
Daniel S. Bratkowsky, Joseph Bancroft
Melvin A. Caldwell, Tennessee Eastman
Duncan M. Chapman, Pacolet Manufacturing
Wyman H. Clark, Graniteville Manufacturing
Ben H. Crowe, Jr., Woodside Mills
William H. Dill, J. P. Stevens & Co.

Clemson continued
Bobby L. Estridge, Rock Hill Printing
Edward R. Gasque, Callaway Mills
Michael B. Gleaton
Joel M. Green
Charles E. Griffin, Jr., Burlington Mills
Stanley W. Hancock
Charles L. Harrison, Woodside Mills
Gilbert A. Heath, U. S. Army
Mack H. Jackson
Henry E. Jennings, Kendall Mills
H. Calbert Lee, J. P. Stevens & Co.
Leon LeGrand, Southern Bleachery
Donald H. Logue, Deering-Milliken, Excelsior Finishing Plant
Joe A. Miller, Cone Mills
William L. Reed, J. P. Stevens & Co.
Conrad M. Shook
David L. Spearman, U. S. Army
Francis K. Starnes, U. S. Army
John B. Thomas, Seminary
Terry F. Thurston, Judson Mill
Thomas L. Williams, U. S. Army

GEORGIA INSTITUTE OF TECHNOLOGY A. FRENCH TEXTILE SCHOOL

Jacob C. Barnhardt, Military
William P. Britt, Jr., Military
Norman R. Brookins, Bibb Manufacturing Co.
John R. Carlisle
Henry B. Christopher, Military; then Burlington Industries
Morris R. Copeland, Military
Bryan O. Dantzler
Walter Dundervill, Military
Robert F. Edwards, Military
Samuel C. Franklin, Military
Phillip L. Galloway, Military
Charles Goncalves
Carroll B. Hart
Arthur M. Herron, Engineering Experiment Station, Georgia Tech
William H. Hightower, III, Thomaston Mills
John P. Hine, Military; then Burlington Industries
Sam Hong, Sandia Corporation
Arthur D. Hull, Burlington Industries
Leonard W. James, Jr., Callaway Mills
Joel E. Johnson, Jr.
Robert F. Johnson, Dow Chemical Co.
Roper Bland Johnson, Military
William C. Knight
Harland E. Mathews, Military
James T. McPherson, North American Rayon Corporation
George O. Meachem, Peerless Woolen Mills
Miss Martha C. Moss, Graduate School
Billy F. Perkins
Bennie H. Peters
John B. Reeves
Ray C. Ruark, Military
Thomas L. Shapard, Military
Ellison A. Smyth, Military
Stuart D. Snyder, Du Pont
Allan C. Spearman, J. P. Stevens
Miss Paula Stevenson
Robert V. Sytz, Mauldin Knitting Mills
John R. Thompson, Bibb Manufacturing Company
David E. Troglin, Military
W. Paden Vinevard, Military
Kevin M. Willis

INSTITUTE OF TEXTILE TECHNOLOGY

Donald A. Barrow, Coats & Clark, Inc.
Thomas E. Boyce, Fieldcrest Mills, Inc.
Lawrence O. Bragg, Mayfair Mills
Henry C. Briggs, Palmetto Service Corporation
Ronald L. Childress, Judson Mills
Alan D. Grover, Excelsior Finishing Plant
Robert L. Holmes, III, Palmetto Service Corporation
David R. Meyers, Joanna Cotton Mills Company
John W. Smith, Graduate Work Massachusetts Institute of Technology

LOWELL TECHNOLOGICAL INSTITUTE

Yoon-Chai Lee
Louis Port, graduate work, University of New Hampshire
Roger E. Rondeau
George A. Scagos, Raffi and Swanson
J. Frederic Burtt, Lowell Tech faculty
Tchang-li Chung, graduate work, MIT
Constantino T. Derecho, Jr.
Donald A. McQuarrie, graduate work, Johns Hopkins University
Augusto Carpio
Kathryn N. Conners
Sheldon A. Feingold
Joseph C. Friedrich, military service
John B. Galvin
Robert A. Gardiner
Boris Hirmas-Rubio
Athena G. Letsou, graduate work, University of Massachusetts
George A. Lyna
Donald Moskowitz
KyuTae Rhee
Morton Schneider
Maurice I. Seifer, Rohm & Haas Co.
Vernon H. Ure, Imperial Color & Paper Co.
William E. Archambault, Berkshire-Hathaway, Inc.
Charles R. Baker, Deering-Milliken
John J. Carter, graduate work, MIT
Edward P. Champy, Jr., LTI faculty
Paul A. Couture, military service
Arthur N. Dellerson
Marcallin D. Desrosiers, LTI faculty
Leonard Edelson, military service
Joseph J. Figiel, Jr., military service
Arnold Forsch
Elaine B. Garside
Roger A. Gauthier, Jr., Chemstrand Corp.
Ernest Glantz
Leon B. Golbin
Robert W. Hodge, Jr.
Robert J. Kriegel, graduate work, New York University
Philip J. McCall, Jr., military service
Alan C. McKittrick, Jr., graduate work, Lehigh University
Paul E. Moody, Portsmouth, N. H., Navy Yard
Robert A. Munroe, graduate work, Harvard University
Neil H. Murray
Frederick F. Pawlowski, J. P. Stevens
Jack Raymond, military service
Wilbert S. Rosenberg
Gerard I. Savarese
Francis V. Sherman

Continued on page 137

See Plenty!

The Strobotac is a quick, economical means of preventing production evils. America's leading manufacturers have applied this instrument to the solution of hundreds of mechanical problems.

Typical uses include the measurement of speed under any driving or load condition, determination of torque vs. speed characteristics, and indication of critical speeds at which vibration or breakdown may occur.

In textiles, G-R stroboscopes have won acclaim as a means of cutting production costs and decreasing rejects. Unlike the ordinary tachometer, these instruments need no mechanical connection with the object under test. Speeds of spindles, cords, pickets, spinning frames, ring travelers, and rayon buckets can all be easily checked, and, if necessary, adjusted to operate correctly. Stroboscopic light allows the user to study production operations normally inaccessible by other methods. These and many other advantages help the manufacturer to achieve efficient operation.

In addition to the Strobotac, General Radio offers industry: the Strobolux, for use where an auxiliary source is needed for brighter light; and the Strobolume, a high-intensity light source for studies at looms and other low-speed machinery. These stroboscopic instruments are well worth their cost — they help prevent serious damage and costly shutdowns, and save you time, money, and headaches.

Type 631-BL
STROBOTAC: $170.00

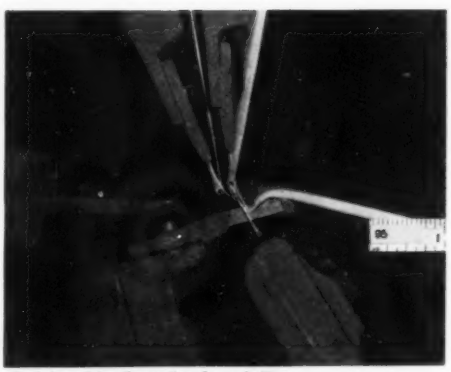
The best ally of preventive maintenance is the Strobotac. Slow motion studies allow the operator to spot and rectify any defects in manufacturing processes while the machine is still operating at its normal speed . . . a speed usually too fast for human visual observation.

631-BL Range: The 60-14,400 rpm range can be extended to 100,000 rpm by using multiples of the flashing speed.

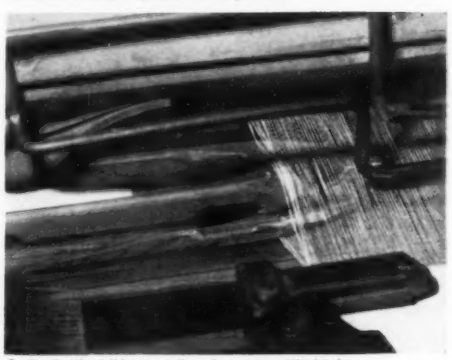
Accuracy: ±1% of dial reading over 900 rpm.

Power Supply: self contained, operates from 105-125 volts, 60 cycles.

Type 1532-B
STROBOLUME
$275



Strobolume "stops" operation of warp knitter.



Faulty shuttle striking warp threads, as seen with aid of Type 1532-B Strobolume.

STROBOTAC®

Manufactured Exclusively by

GENERAL RADIO Company 275 Massachusetts Avenue, Cambridge 39, Massachusetts

Lowell continued
Robert A. Silva, graduate work, Lowell Tech
Gerald J. Smith, graduate work, Lowell Tech
Sherman J. Spiegel, graduate work, Lowell Tech
Paul H. Sutherland
Philip E. Swanson, establishing own business
Paul A. Tremblay, military service
Frederick D. Crowe, Jr., military service
Raymond F. Dunn, military service
Ralph P. Stern
Claire M. Vervaert
Roy J. Zuckerberg, military service
W. Preston Cooper, E. I. du Pont de Nemours & Co., Inc.
Samuel Epstein
Leonard J. Harris
William L. Kelley, military service
Paula M. Molloy, Ansonia Mills
Vincent A. Murdico, military service
James E. Murray
Albert J. Weil
David B. Shaughnessy, military service
Solly Toussieh, military service
Thomas J. Bennett, Portsmouth, N. H., Navy Yard
Charles E. Llewellyn, Jr., Filtration Fabrics Co.
William E. Santos, Quartermaster Research and Development Command
Edward R. Sheldon, military service

NEW BEDFORD INSTITUTE OF TECHNOLOGY

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James W. Harrison, Air Force Cadet
Francis W. Marco, Deering-Milliken Co.
Ronald H. Mitchell
Stefan T. Mulawka
Julien P. Olszowy, Quaker Oats Co.
Richard L. Pepin, Air Force Cadet
Charles E. Hodgkins, Cornell Dublier
Patricia A. Perry
Ronald S. Perry, Graduate Work, Lowell Technological Institute
Kenneth J. Provost
William Sherman, U. S. Army
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Akram Habid Sholji
Allen F. Sisson, Institute of Textile Technology
Bahjat Zia Yousif

NORTH CAROLINA STATE COLLEGE SCHOOL OF TEXTILES

Iftkhar Afzal, graduate work
Rahmat Ali, returning to Pakistan
Samuel F. Austin, military service
Bobby J. Bailey, Rock Hill Printing & Finishing Co.
John D. Barnhardt, Barnhardt Elastic Corp.
Henry F. Beatty, J. P. Stevens & Co.
Stanley B. Berman, E. I. du Pont de Nemours & Co.
Donald R. Carey, Riegel Textile Corp.
George C. Cochran, will study law
Billy R. Coggins, Pittsburgh Plate Glass Co.
Dallas B. Cox, John P. King Mfg. Co.
Bobby D. Deans, Abbeville Mills
Earl S. Dunlap, Lehigh Dyeing & Finishing Co.
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Vance G. Fowler, J. P. Stevens & Co.
Robert S. Gardner, Burlington Industries
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Richard L. Graves, Burlington Hosiery Co.
Lonnie J. Griffin, Cherokee Textiles
Robert P. Hastings, military service
John C. Heath, J. P. Stevens & Co.
Ahmed A. Hilal
James R. Howard, J. P. Stevens & Co.
John E. Howard, Chatham Mfg. Co.
Lacy B. Howell, Amerotron Corp.
Robert C. Hunter, American Enka Corp.
Gamal E. Ismail, returning to Egypt
William M. Israel, Montrose Worsted Mills
Lewis C. Jackson, Burlington Industries
Carl R. Jacobs, U. S. Navy
Harris S. Johnson, Joseph Bancroft & Sons
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Donald H. Kirby, Highland Park Mfg. Co.
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Sanford L. Levine, Morgan Fabrics
Charles D. Livengood, Research Dept., School of Textiles, N. C. State College

N. C. State continued
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Tolly B. McLaughlin, U. S. Air Force
Neil L. McRainey, Jr., J. P. Stevens & Co.
Ben C. Mayo, II, Mayo Knitting Mills
Michael Miller, Jr., Raytex Chemical Corp.
Ronald B. Moore, U. S. Navy
David A. Poole, Burlington Industries
Jimmy L. Poteat, Chatham Mfg. Co.
Kendrick B. Presson, J. P. Stevens & Co.
Robert M. Price, Graduate Work, U. N. C.
Clarence E. Ray, Cone Mills Corp.
John M. Reed, Jr., military service
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Robert J. Tanen, J. P. Stevens & Co.
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Harold F. Wagner, J. P. Stevens & Co.
M. Wasserman, Textiles Panamericanas Burlington International
Roy D. Weant, Cone Mills Corp.
Olin E. Wilson, Burlington Industries
Robert L. Womick, American Thread Co.
David J. Worthington, J. P. Stevens & Co.
J. C. Yancey, Dow Chemical Co.
Norman G. Yarber, J. P. Stevens & Co.
Alejandro Yujuico, Jr., returning to Philippines
Hassan Makhlouf, Consolidation Funel of Cotton Textile Industry

PHILADELPHIA TEXTILE INSTITUTE

Beverly T. Adams, Albany Felt Co.
Ruben Alonzo
Jerome P. Alpin, Military
James T. Y. T. Ang, returning to Philippines
John P. S. Ang, Graduate School, M.I.T.
Charles W. Baker, Tennessee Eastman Corp.
Charles G. Barnes
Joseph Barocas
Juan Betancur, returning Colombia, S.A.
Martin E. Birnbaum, E. I. du Pont de Nemours
Richard W. Blitz, Baeringer Knitting Mills
Victor C. Braun, Jr., Military
Stanley Cear, Atlas Powder Company
Publio L. Cevoli, Jr., Johns Manville Corp.
George R. Clyman, Aldon Rug Mills
Norman R. Cohen
Stanley Cohen, Pyramid Knitting
Thomas C. Cox, Magee Carpet Company
Thomas D. Dee, Ballston Stillwater Knitting Co.
Charles E. DeGreen, Eastman Chemical Prod.
Erwin Dickman, Military
Pieter S. Diehl, Shuler and Benninghofen Woolen Mills
Abdul K. Durrani
Alvaro Olarte Echavarria, returning Colombia, S.A.
Robert B. Egbert
Richard D. Evansberg
Frank A. Ferrara, Phila. Textile Institute
Charles Finder, Geigy Chemical Co.
Allan R. Flickstein, Military
Raymond M. Franco, J. Valentine & Co.
Stanton A. Freedman, Textured Yarn Co.
Richard V. Freligh, Military
Morris Glynn
John Grange, Clinton Corn Processing Co.
Morton G. Gropper, G & G Knitting Fabrics Co.
Edward W. Harris, Dow Chemical Co.
Gerald L. Harrison, Albany Felt Co.
Nathan B. Harvey, Woolrich Woolen Mills
William S. Hoffman
Joseph P. Italiano, Barbison Textile Exporting Co.
John W. Kennette, Air Reduction Chemical Co.
Robert P. Kirchner, J. P. Stevens Co.
Morton J. Klein, Jersey Dyeing Co.
Stanley Kleinman
Paul S. Knoff, Military
Philip M. Kupetsky, Shamokin Woolen Mills
Jaime Landau, returning to Venezuela
Stanley A. Levin, Glo-Ray Knitting Mills
Edmund L. Liquori
Richard Lutzer
Bernard L. Mainwald, Fabrex Corporation
Mahendra C. Mashruwala, returning to India
Herbert I. Matt, Aldon Rug Mills
Charles N. Miller, Military
Carl T. Musselman, Textured Yarn Co.
Richard F. O'Donnell
William R. Parry, Nelson Newmark Co.
Edgar Paul, Burlington Industries, Inc.
Harold Pototsky, Karagheusian Company
Allen H. Pottash, Military
Joseph P. Reuter
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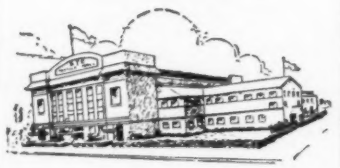
Saverio E. Russo, Military
Abe J. Salaman, Gold-Tex Fabrics
Francis L. Scardino, Graduate School
Morton Setchen, Military

Make your plans to go to the
GREENVILLE SHOW



Textile Hall, Greenville, S. C.
OCTOBER 6-10, 1958

See TI's October issue for a complete preview of the show with pictures of equipment to be on display and a handy floor plan of the exposition hall.

GOT YOUR SHOW TICKETS?

You must have either a season pass or one-time-admission ticket to enter Textile Hall.

FOR TICKETS, ask your suppliers' representatives or write to the Editors, "Textile Industries," 806 Peachtree St., N. E., Atlanta 8, Ga.

FOR SEASON PASSES, write to Miss Bertha M. Green, director, Southern Textile Exposition, P. O. Box 1323, Greenville, S. C.

Philadelphia continued
Pravin T. Shah, Graduate School
Eric E. H. Shih, returning home
Barry M. Silberman, Military
Neil B. Steinberg
Donald R. Stogo, Cherokee Finishing Co.
Allan Z. Stolzer, Reliable Textile Co.
Alfred C. Sussman
Fuyun Tjian
M. Venkataswamy, returning home Philippines
Murray M. Young
Francis J. Zeglen, Graduate School, I.T.T.

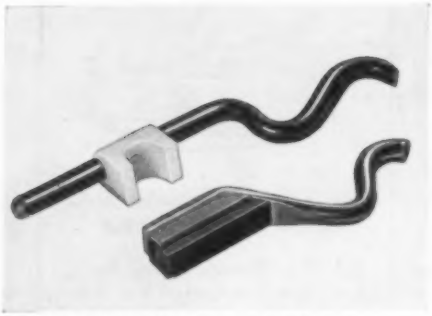
INSTITUT DES TEXTILES DE LA PROVINCE DE QUEBEC

Andre Beaudry
Jules Bedard, Canadian Celanese Ltd.
Jacques Blanchette, Canadian Industries Ltd.
Normand Bonin, Dominion Textile Co. Ltd.
Raymond Brassard, Dominion Textile Co. Ltd.
Marcel Chainey, Dominion Textile Co. Ltd.
Claude Dubuc, Domil Ltd.
Jacques Genest, Dominion Textile Co. Ltd.
Jacques Guilbeault, Dominion Textile Co. Ltd.
L. Marin Langelier, Canadian Industries Ltd.
Bastien Methot, Methot et Freres
Real Nadeau, Canadian Industries Ltd.
Normand Veys

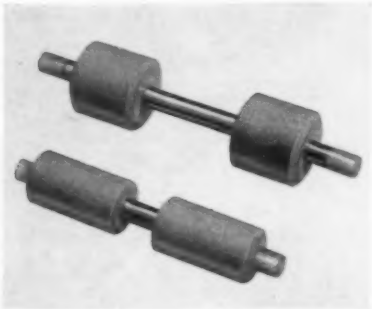
THE HAMILTON INSTITUTE OF TECHNOLOGY

Frederick W. P. Ball, Canadian Industries Ltd.
Charles W. Bowman
Roland Boyer
Rene-Claude Courtemanche, Dominion Textiles Ltd.
Robert C. Dickson, Canadian Industries, Ltd.
Joseph Flosman
Jose Ramon Gonzalez, Mexico
Ronald H. Hanson, Canadian Cottons Ltd.
Richard Lalonde, Courtaulds (Canada) Ltd.
George P. Vetricin

Cut Costs 3 Ways!

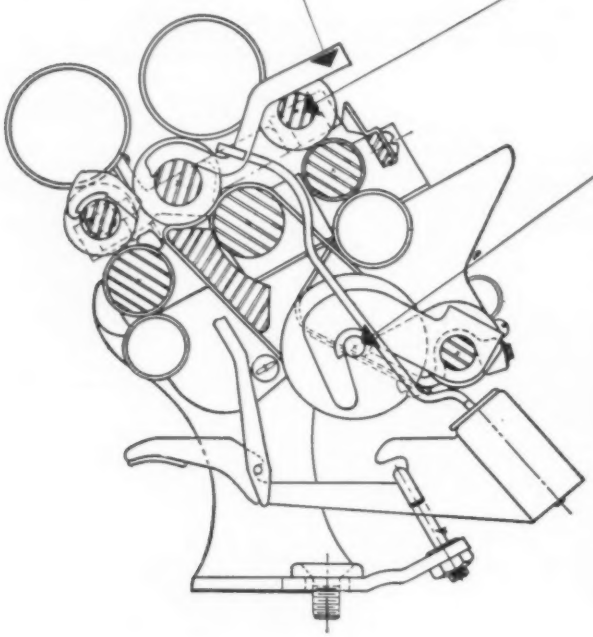


Back saddles of Nylon reduce arbor wear — do not need oiling.



Nylon end gudgeons on solid back top rolls require no lubrication — wear less.

Nylon inserts in tension roll supporting arms prevent wear which would spoil roll concentricity, apron alignment and even drafting of stock.



1. Reduce Wear
2. Eliminate Lubrication
3. Decrease Roll Picking

NYLON GUDGEONS AND INSERTS BY SACO-LOWELL

Saco-Lowell nylon gudgeons and inserts show little if any wear after long operating intervals. Since they require no lubricating, the absence of oil cuts dirty lint and subsequent roll picking to a minimum. This adds up to a very important saving in maintenance and operating costs.

Check your solid back top rolls, back saddles and tension roll supporting arms for worn surfaces. If any have developed, change over to these new nylon gudgeons and inserts. They're low in cost and high in return on your investment. "It *Pays* to use genuine Saco-Lowell Replacement Parts".

SACO-LOWELL SHOPS

60 BATTERYMARCH STREET, BOSTON 10, MASS.

Shops at BIDDEFORD & SACO, MAINE; SANFORD, N.C.; EASLEY, S.C. Sales Offices: CHARLOTTE · GREENSBORO · GREENVILLE · ATLANTA

HOW OTHER MEN MANAGE

• Letters to Editor • Technical Discussion •
• Manufacturing Briefs • Kinks & Short Cuts • Comments from Readers •

Mill men reply to "More Speed with 8" Quills?"

The Question Briefed: *We should like to increase the speed of our 44" X-2 looms, now running at 178 ppm with 8¾" quills, and we have heard that by going to an 8" quill we can increase the speed 10 to 15 ppm. Could you tell us what other mills have done on this from the standpoint of changeover cost, repair costs, quality, efficiency, and job loads?*
CONTRIBUTOR NO. 1025, *July*, '58.

Here are several replies to the above question which should prove helpful to our correspondent. Others are invited.—The Editors.

THE EDITORS:

On this type of loom the cost of the changeover should not be high. I would first contact a supplier for new shuttles to take the 8" quills. I am sure he could furnish a shuttle which would eliminate the necessity of any changing of back or front binders or boxes.

There would have to be small adjustments on the magazines, of course, but this should not entail any new parts. If the looms are fitted with the conventional type of drive, larger pinion gears would have to be purchased at a price of about $3.20 each. (The price quoted is the one in use a year ago.)

Repair costs would be slightly higher at first until the fixers got used to higher speed. More preventive maintenance will have to be practiced. When the situation settles down, the repair costs should not be much higher on a 44" loom. According to my experience, quality will definitely improve, even with the higher speeds.

There is a limit to where we can go on quill length on the type of fabric which would be woven on these looms. It is surprising the difference ¾" will make when yarn is pulling off a quill. The very slightest deviation from "true" of the quill in the shuttle on the 8¾" quill will aggravate breaking before change, bad changes, pulled edges; and any faulty yarn which comes near the end of the quill adds to one's troubles.

Loom stops should decrease due to less filling breakage, and yarn efficiency would naturally go up. I cannot give exact figures, but I would think that with the changeover with good warps and filling you should gain 5% in efficiency.

A suggestion comes to me here that would cost a little more. I have done it on some occasions. Bring the speed up in steps. This helps weavers and fixers to get used to it more easily and also cuts down on breakage at the start.

I would not suggest changing fixer's work load if he had a full load on 8¾" quills. The added

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► All contributions must be postmarked not later than midnight, August 15, 1958.

► No limit to the number of entries an individual may submit in any one contest.

► All entries paid for upon acceptance — no waiting. Extra payment for photographs that are usable. Extra consideration is also given kinks accompanied by legible pencil sketches or drawings.

► Entries must not have been published previously and must not be submitted to any other publication.

Send your contest entry to: The Editors, TEXTILE INDUSTRIES, 806 Peachtree St., N. E., Atlanta 8, Georgia.

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speed with the necessity for closer attention to settings and greater wear on change and magazine parts will keep him busy, plus the fact that breaks, when they come, will be worse ones.

You might come up a few looms per weaver, depending on his present load which I presume is based on stops per loom per hour and the time it takes to start up. He will definitely have fewer filling breaks. A very exact efficiency and loom-stop study should be made before one makes the changeover. This will allow one to get a good picture of the advantages of the change.

CONTRIBUTOR No. 1027

THE EDITORS:

I am sorry I cannot give you anything pertaining to the question you submitted. However, I should like to comment briefly on the subject.

The question is rather vague. Before answering a question like this I should wish to know what section shuttle is running at this time, and the type of clutch in use on the 44″ X-2 loom.

We have changed a large number of looms, some of which were 44″ X-2's, from a section "I" shuttle for an 8¾″ quill to a section "E" shuttle for an 8″ quill. We tried these looms at 190 picks and finally went back to our original speed of 180 ppm.

We have several hundred looms running at 190 ppm, powered with clutch-brake drives. I would not hesitate to put 8¾″ quills on these looms and keep them at 190 ppm. We ran tests on 8¾″ quills and found that the filling breaks were no higher than they were on 8″ quills. We finally decided to drop it rather than change our spinning frames to 8¾″ quills.

CONTRIBUTOR No. 1026

THE EDITORS:

We have given some consideration to changing our 44″ X-2 looms to a 7⅜″ quill and an "E" section shuttle. This applies only to those looms equipped with Unifil. We estimate that we could increase loom speeds from 184 ppm to 200 ppm or higher.

The cost of this changeover would involve new lay ends, box back extensions, treadle brackets, and possibly new harness cams. We do not have a firm cost for this changeover.

As to repair cost, I am sure you could expect higher cost at a faster loom speed.

Quality should be as good or better, due to a smaller shed required for the small shuttle. The same holds true for efficiency.

Looms per fixer would probably need to be decreased, but the fixer cost per pound produced should be less. The same would be generally true for weaver assignments.

The inquiry you sent states "We are running our 44″ X-2 looms at 178 ppm. . . " We feel that this is lower at the start than 44″ X-2 looms should run.

CONTRIBUTOR No. 1028

THE EDITORS:

Although I am not too familiar with the X-2 loom, I have had considerable experience with speeds on other types of looms. Regarding this question, I would not change the quills as that would mean changing the shuttle, boxes, binders, and pickers. One can get as good result with an 8¾″ quill as with a shorter one.

With this in mind the cost of the speed up would entail only new motor pinions. Repair costs should run about ⅓ more, however.

Seconds will run a little higher, probably from two to five per cent greater than with the slower speeds. Loom stops will be about two per cent higher also. Weavers should keep the same job load. Fixers should have no trouble—I probably would give them a head loom fixer.

I also suggest that one section be speeded up at a time, checking results weekly. The looms should settle off somewhere within a four- to eight-week period. After the first section has begun to run properly, speed up another. Follow this procedure until the room is running in the desired manner.

One should not have too much trouble with a 44″ loom at the speed of 200 ppm if the loom is braced well—well-fitted cam and crankshaft boxes, tight pitman arms, etc. Shuttles will have to be boxed well at all times. In other words, loom fixing will have to be on the ball. Remember also that the yarn will have plenty to say about high speeds. Weak yarns will give trouble.

CONTRIBUTOR No. 1029

THE EDITORS:

We are not too sure that one could increase loom speeds from 178 to approximately 190 to 195 by changing the quill size. Several years ago our experience was to change from an 8″ quill to an 8¾″ one. Since that time, due to various reasons, we have increased our speed over what we were running when we had 8″ quills.

From the loom standpoint we feel that the cost of the change would be very minor. This depends on the lay end plate. If the plate is the split type the bumper may be moved in, a change that would not be costly. Actually it is possible that the parallel foot, shoe, and tongue could just need an adjustment. These parts would not have to be replaced.

The expenditure would include the new shuttle and the necessary quills per loom.

We do not feel that with an 8″ quill it is very possible that the performance of the loom would be better. Before we would make this change we would try and improve our speeds under present conditions. All elements should be taken into consideration—elements such as spinning frame efficiency, bunch waste, and battery hand job loads.

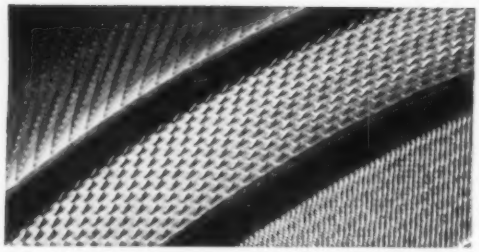
CONTRIBUTOR No. 1030

THE EDITORS:

The writer failed to mention the type of goods being manufactured, especially the count of the filling being run. Unless he is using 36s/1 or lighter I do not believe the change he speaks of will help him materially.

These lighter counts on an 8¾″ quill will break much worse than on an 8″ or shorter quill. This is, of course, brought on by the end of the quill not being centered with the shuttle eye. This can be caused by the spring not holding the quill perfectly true or just as often by a bent or warped quill.

This condition caused us quite a few headaches where running 41s



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filling on carded broadcloth. As we quill our filling, we find that a warped quill will run on the quiller which, if it were on a spinning frame, would cause the end to come down continuously. Of course such a quill would be removed from spinning production.

These same conditions that give so much trouble on the numbers mentioned will not give any appreciable trouble on coarser counts.

I know one mill, which has a reputation of being one of the outstanding print cloth mills in the country, that cut the speed on their 42″ X-2's to 175 ppm. They also run an 8¾″ quill.

On our original 40″ X-2's we are now using a molded shuttle. These shuttles are running exactly five times as long as did a conventional dogwood shuttle. This loom does not have a clutch-brake drive and did not have a satisfactory shuttle in the first place. But on the strength of the showing here we are going to this piece of equipment on all our X-2 looms. This shuttle is heavier, and when putting it in we had to cut the power. This perhaps looks backward, but nevertheless we found it so.

The X-2 is designed for a larger shuttle in every way, and unless the gentleman in question is experiencing filling breakage, I do not believe changing to a small shuttle and bobbin will help enough to offset the other costs.

CONTRIBUTOR No. 1031

THE EDITORS:

We estimate the cost of the changeover to be approximately $75.00 per loom, and this figure includes the cost of new quills, adjusted for the salvage value of the old ones. We also feel that repair costs would run aproximately 50% higher.

Quality depends on the construction and the feeler motion used. If no feeler or semifeeler goods are being produced, we feel that there will be an increase in quality. If full-feeler motion is used, there probably will be a decrease in quality.

Warp stops should increase by at least 10 per cent. Filling stops will definitely increase, but we have no way of knowing how much.

Fixer assignments will depend in part on the quality desired and the skill levels of the fixers, but it is safe to assume that the fixers' assignments will have to be reduced—perhaps as much as 10 to 20 per cent.

As for the looms per weaver, this question has no one answer. Management may assign as many or as few looms to the weaver as it prefers. The determination of the optimum assignment is an extremely complex calculation, involving loom stops, repair times, quality patrols (if any), profit level per style, mill balance, customer satisfaction, and a few other variables. The correct assignments may be anywhere from 25 to 125.

The last three or four questions are difficult to answer without more precise information; and a book could be written on the last question. I have treated the problem in a rather cursory fashion, but I do not see how a specific answer could be correct. More generalities such as those above will probably only add to the confusion.

The questionnaire failed to mention related costs, but since these can be important, I will. They include: (1) higher battery filling costs; (2) higher bobbin transportation costs; (3) higher bobbin stripping costs, if done; and (4) higher spinning or rewinding costs.

CONTRIBUTOR No. 1032

HOW OTHER MEN MANAGE

Speeds up roving sizing

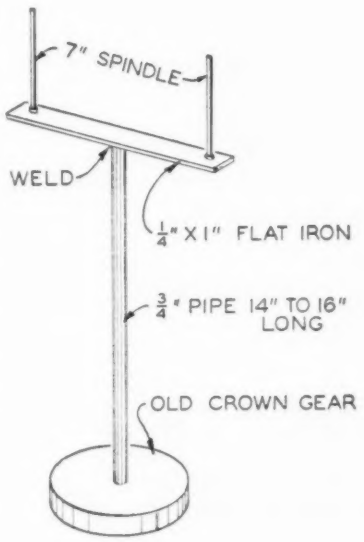
THE EDITORS:

In most mills, especially sales yarn mills, it is necessary to do daily sizings. In the carding department it is customary to size the roving in eight-bobbin batches.

For instance, there may be running in the spinning room yarns from 50s to 60s, being made from 3½ hank roving. There also may be 16s to 24s being made from 1½ hank roving; and 24s to 36s running on 2.10 hank roving. Therefore, to get a four-bobbin sizing from the different numbers, the size clerk must collect eight bobbins of the 3½ hank roving, eight bobbins of the 1½, and eight from the 2.10. All told there will be 24 bobbins to be sized. If each of these bobbins is sized separately, the size clerk must run 12 yards from each bobbin to get an average hank size, thereby turning the reel 288 times.

Since the roving runs double in the creel, why not size two bobbins together and reel the double roving 12 turns to produce 12 yards instead of 24 times to produce 12 yards single?

To make a stand to hold two bobbins, use one piece of flat iron 1″ wide, ¼″ thick, and 8″ in length. Drill and tap a ½″ hole ½″ from each end. Into these holes thread 7″ pins, of appropriate diameters, to hold the roving bobbins.



Use a piece of ¾″ pipe from 14″ to 16″ long (to suit) and insert one end of it into an old crown gear to act as base.

CONTRIBUTOR No. 9099

CHECK THESE FEATURES OF THE *CEN-TENNIAL SYNTHETIC BLENDER*

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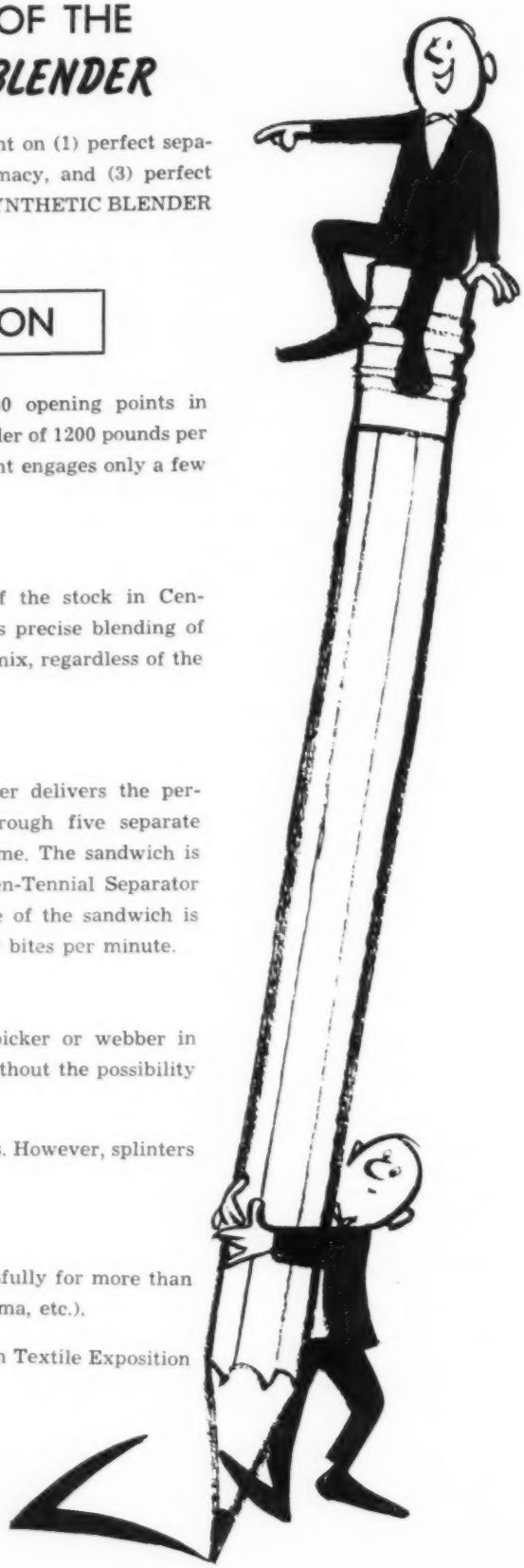

CEN-TENNIAL delivers perfectly blended stock to the picker or webber in suitable form, so that these machines can do their work without the possibility of unblending.

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When doffing short pays off

This discussion began in the December, 1957, issue of TI, pp. 77-80, with the article "What Size Package Should We Make?" Since that date the author has twice defended his work, once in the March, 1958, issue, p. 137. His second reply made to CONTRIBUTOR *No. 1007 (June, p. 167) follows.—The Editors*

THE EDITORS:

The old rule that the largest possible spinning package is the most economical has been rendered obsolete by the development of unwinding machinery with a "by-pass" feature. This innovation has made it possible for a traveling knotter to by-pass a given spindle if the yarn supply of its package has not been exhausted. Likewise in the case of continuously traversing units and a stationary operator, the operator can ignore any unit which is still producing.

Thus it can readily be seen that it is important to have the running time of each bobbin equal to the length of the traversing cycle or to multiples thereof. If the running time is slightly less, no harm is done. However, if the unwinding time of a package is slightly more than a cycle of the knotter, spindles will be idle a considerable part of the time.

Thus a larger package can actually result in lower production on spooling and winding machinery, higher piece rates, and therefore higher costs per pound.

This is particularly important in view of the fact that there usually are very few spooling and winding machines. If they fail to obtain the proper efficiency, they can become bottlenecks which retard all subsequent production in the plant.

As far as cost is concerned, a larger spinning package will tend to reduce only one kind of cost in the spinning room and that is doffing cost. All other labor costs will be influenced only slightly. In the case of a large package, doffing cost is already so low that it is usually exceeded by spooling and winding costs.

F. G. ERNEST

A few more "whys" on spinning drafting systems

THE EDITORS:

I have been greatly surprised that as late as 1958 there should be correspondence in your columns about the "best" drafting system. The problem was solved 40 years ago with the invention of the double-apron system by Fernando Casablancas. Many other systems trying to equal the yarn quality produced by two aprons have not succeeded, though it was found that one apron working in conjunction with a very small top roller was better than no aprons at all.

Your CONTRIBUTOR No. 9083 in the February 1958 issue of TI, p. 165, has only to look back over the past 40 years to see that many before him have failed, as he did, to "make an apron-draft system which would have no apron."

Your Canadian CONTRIBUTOR No. 9051 in your May, 1958, issue, p. 131, correctly explained the reasons why two aprons provide the fiber control necessary for good drafting, thereby allowing high drafting. However, his list of requirements for a high drafting system, including such points as simplicity of construction, little extra attention, low maintenance cost, etc., needs further discussion.

I am associated with a company which has had considerable experience, over many years, with the Casablancas two-apron system, and I can assure you that, while it was common 25 years ago to emphasize the features he mentions, today this is an anachronism.

If simplicity alone were the yardstick, what could be simpler than ordinary roller drafting? Any other system must be more complicated; the question nowadays is not merely whether a drafting system is as simple as previous ones, but whether any added complication is justified by improved quality, higher production, and so on, measured as spinning costs in cents per pound of better yarn.

Surely, there can no longer be any doubt that the two-apron system has more than justified the little extra complication, attention and maintenance it involves. The many millions of spindles installed throughout the world surely prove this point. Even more conclusive proof is furnished by the fact that all machinery makers have taken advantage of the expiration of the original Casablancas patents to use two aprons in their high drafting systems. Imitation is the sincerest form of flattery.

CONTRIBUTOR No. 1039
(England)

Doff-point knockoff

THE EDITORS:

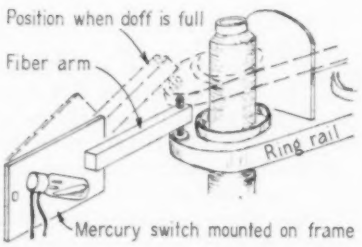
As all spinning room men know, when doffers are on a bonus plan they sometimes neglect quality for the sake of quantity. It is only natural that each doffer wishes to earn as much as possible.

In our spinning room, since we are on a bonus plan, we have noticed that we have some doffs too full. This naturally gives us trouble in winding and weaving.

We notified spinners and doffers

many times about that condition, and for a while we actually noticed a measure of improvement; however, the improvement was not enough to satisfy us and our customers. We began shopping for a mechanical device which would stop the spinning frames when they reached a predetermined doffing point.

The answer was in the form of a mercury switch. We mounted one on a bracket secured to the roll beam and positioned close to the frame motor switch box (we used about three feet of wire to connect the mercury switch to the power source) at the end of a ring rail. An arm from the switch is



positioned to be lifted by the ring rail as it traverses. A screw adjustment allows the exact knock-off point to be selected, as the switches are very sensitive. We boxed in the mercury switches to protect them from accidental bumpings, fly, etc.

With our bobbin builds the ring rail picks up the switch arm when the packages are about one-half full and continues to lift and lower the arm until the rail reaches the predetermined knock-off level. At that point the mercury switch breaks the circuit and the spinning frame stops.

I realize that there are other switches available which will perform the same function. What I am interested in getting across is the idea.

CONTRIBUTOR No. 1023
(*Canada*)

Pick-out tool made from needle and mechanical pencil

THE EDITORS:

Most stylists, designers, weaving overseers, and textile technicians prefer to use a sharp-pointed tool for analyzing fabrics, counting sley and picks, picking out weaves, determining ply and twist of yarns used, etc. A very useful and inexpensive tool for this purpose can be easily made as follows:

From an ordinary mechanical pencil that is equipped with retractable lead, remove all the lead and in its place insert an ordinary sewing needle of the desired size. It will be found that the needle has an ideal point for this particular purpose. An additional advantage is the retractable feature, which permits the tool to be carried in the pocket without the risk of getting pricked fingers or torn clothes.

CONTRIBUTOR No. 1018

More about making shuttles thread heavy filling

THE EDITORS:

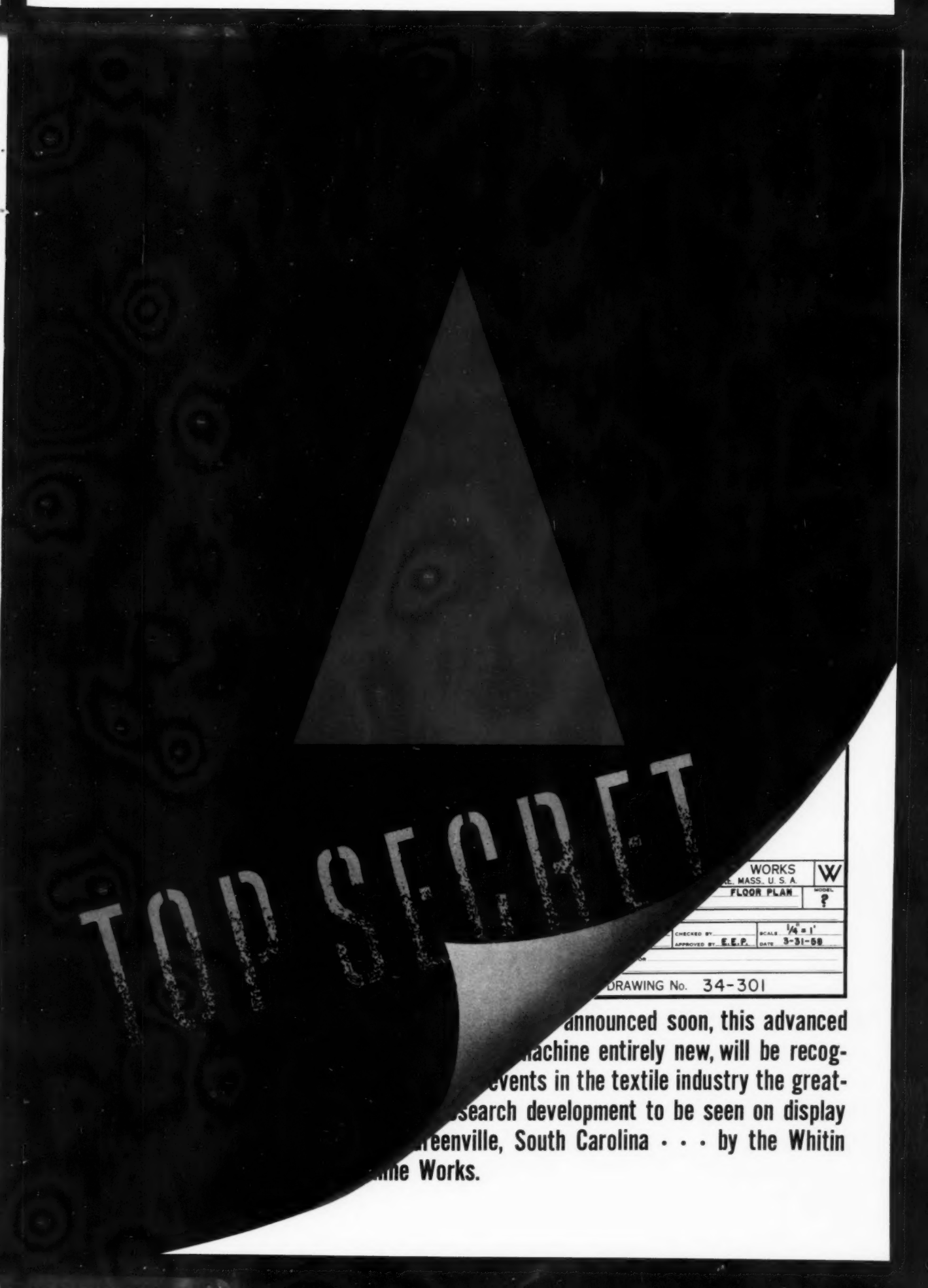
Please forward this shuttle eye to CONTRIBUTOR No. 9058. It may solve his difficulties. Tell him also to put new shuttles in his looms at the time he changes to this eye.

CONTRIBUTOR No. 1038

(We forwarded the eye as requested, but only after we photographed it for use in this department. It is pictured here in top and rear views. See TI for May, 1958, p. 134.—The Editors.)

Rear view

Top view



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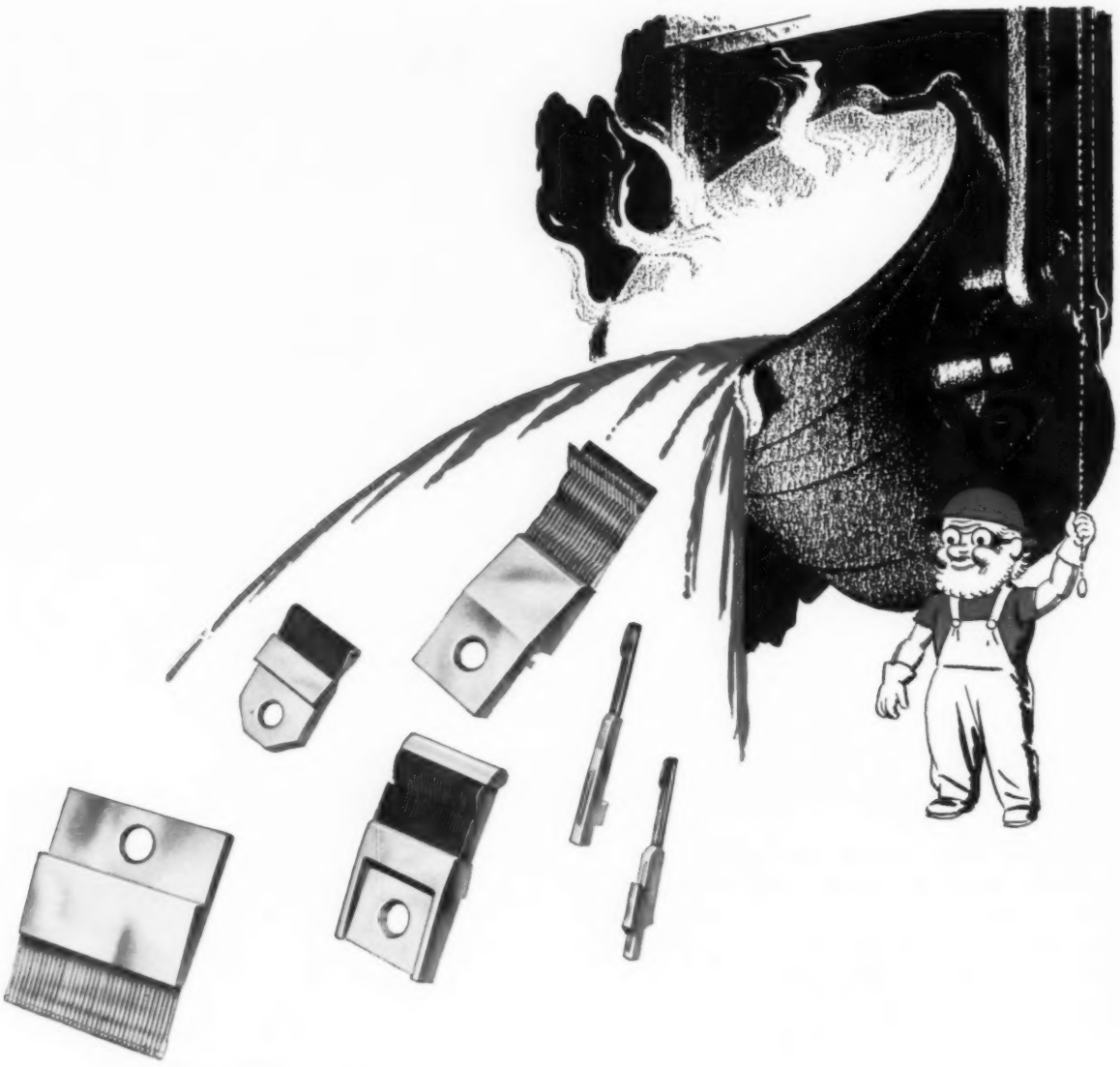

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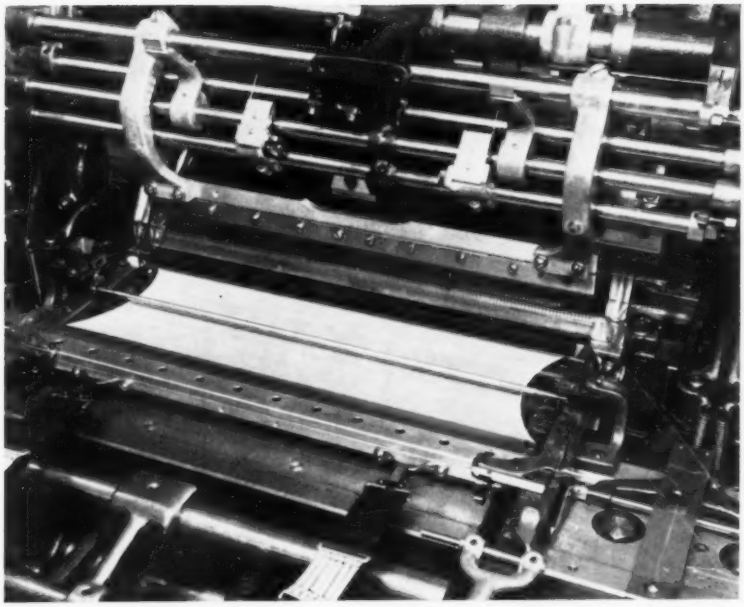
Fully automatic draw-off bands on the new "Reading" Type 60 full-fashioned knitting machine. The narrow bands operated from the main draw-off reels, as shown by this photograph, hook the welt wires and draw the fabric from the needles as knitting takes place after the half welt turn. Through their use the stockings are drawn completely from the needles, removed from the reels, and delivered to the tray located below the take-up arrangement. The operator can easily remove welt wires from this position and return them to the welt wire insertion magazines in preparation for the next set. The bands are then automatically returned to their correct position for again engaging welt wires at the proper time.

38-section f-f machine designed for 2 for 1 operation



Automatic welt wire insertion is another feature of the machine. This photograph illustrates the method by which the welt wires are automatically removed from the magazine and drawn down into operating position in the bridges by means of control fingers actuated from the camshaft.

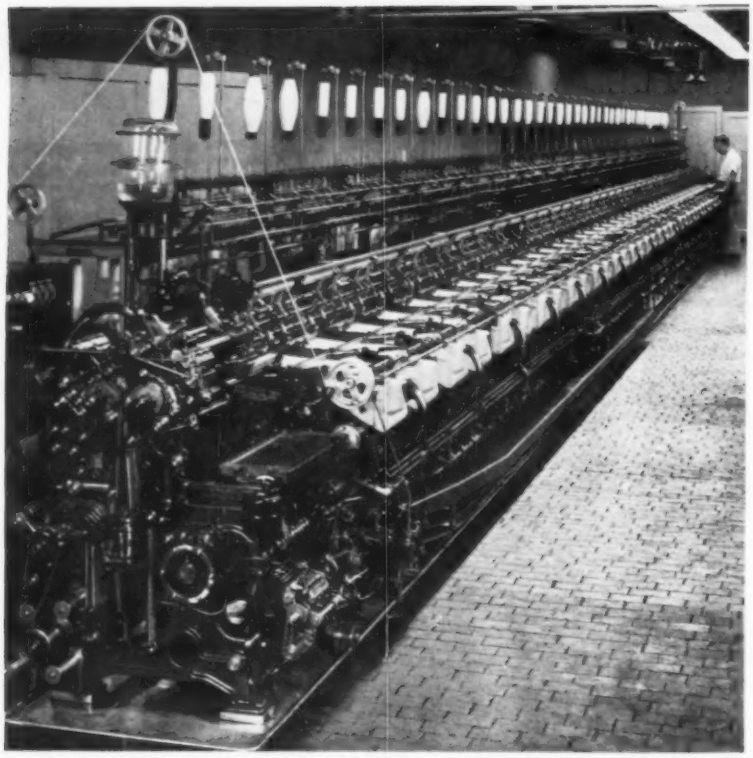
Staff report

ONE MAN can satisfactorily operate two of the new "Reading" Type 60, 38-section, automatic full-fashioned hosiery knitting machines and have as much idle time as when operating two of the R-100, 30-section machines, studies conducted by Textile Machine Works show.

This is accomplished, company spokesmen explained to those viewing the machine in the plant at Reading, Pa., when commercial availability of it was announced, through additional automatic features coupled with higher speeds, and results in an average production increase of 41 to 46 per cent, or from 7.1 to 7.65 dozens per eight-hour shift (varies according to style of stocking and number of courses required).

Higher speeds were said to have been made possible through use of a completely redesigned cam motion, in which theoretically established cam curves have been employed to provide the most accurate and correct motion possible for the production of a superior fabric.

Main speed has been increased from 100 courses per minute to maximums of 110 to 120, splicing from a previous speed of 85 to a



Over-all view of the automatic 38-section full-fashioned hosiery knitting machine. Note the trays located below the take-up arrangement.

new speed of 100, while narrowing speed remains at 75 courses per minute at the present time. Half-turn and welt turning speeds have been increased to 30-35 courses per minute from the previous speed of 12 courses per minute.

Smoother machine operation was attributed to:

(1) Increased diameter of needle bar and presser shafts (from 1-9/16″ to 1-13/16″), which reduces shaft torsion and increases uniformity of action at high speed.

(2) Installation of a presser cam unit at every frame section.

(3) Additional balancing cam units provided to insure smoother operation at high speed.

(4) More uniform distribution of cam levers.

Sinker head design permits the use of nylon inserts for both top and bottom. According to the manufacturer, this results in a construction that increases resistance to wear from yarns and attack from knitting solutions. It was stated that sinker heads of this type have been in operation under mill conditions for five years, and show only negligible wear of presser edges and slots. Also definite reduction in needle beard wear has been noted.

While the automatic narrowing heads and friction boxes of the previous model remain as principal features of the new Type 60 machine, a number of new or improved attachments and devices were said to contribute to more efficient machine operation:

Automatic Operation of Main Draw-Off Straps. On the previous machine it was necessary for the operator to hook-up the main draw-off bands, turn them in to position for engaging the welt wires, and later remove the stockings from the reels. In the case of the Type 60 machine, however, these manual operations are eliminated. Refer to the top photograph on page 151 to see how this is done.

Automatic Welt Wire Insertion. A magazine is provided above the welt bar bridges into which one or more welt wires can be placed at any time during the knitting cycle prior to the time at which they are required and at the operator's convenience. At the proper time a welt wire is automatically removed from the magazine and drawn down into operating position in the draw-off bridges by means of control fingers actuated from the machine camshaft. (See the bottom photo on page 151.) Use of this device frees the operator for other duties and makes it unnecessary for him to time his actions accurately in order to be available for inserting welt wires at the proper time.

Improved Welt Bar Unhooking. Welt bar unhooking has been automatic on the R-100 machine for some time, but it has been necessary in the past for the operator to move from one end of the machine to the other checking the welt bar unhooking and then bring the welt bars back into position by manual operation of the auxiliary draw-off reel shaft. The Type 60 machine brings into operation a more efficient type of welt bar unhooking device, eliminating manual operations and bringing the bars back to their starting position automatically.

Double Coulier Motion with Safety Arrangement. On the Type 60 machine the couliering load is distributed more evenly through the use of two separate coulier motions. One unit controls travel of the slurcam box bar, while the other provides the means for driving and synchronizing the movement of carrier rods, friction boxes, and shock absorber. These units are equipped with safety switches to eliminate the possible damage.

Improved Positive Carrier Drive. This device prevents slippage of main, welt, and alternating friction boxes, thereby permitting them to travel at uniform speed and in correct time with the shock absorber action. In the improved drive the purpose is accomplished through use of drive rollers at top and bottom of the drive bar. Its use results in better selvages and less needle breakage, especially at the higher speeds of the Type 60.

Redesigned Main Chain Motion. Because of the increased length

Improved Komet vertical shaft bushings

by K. O. Metz
Exclusive

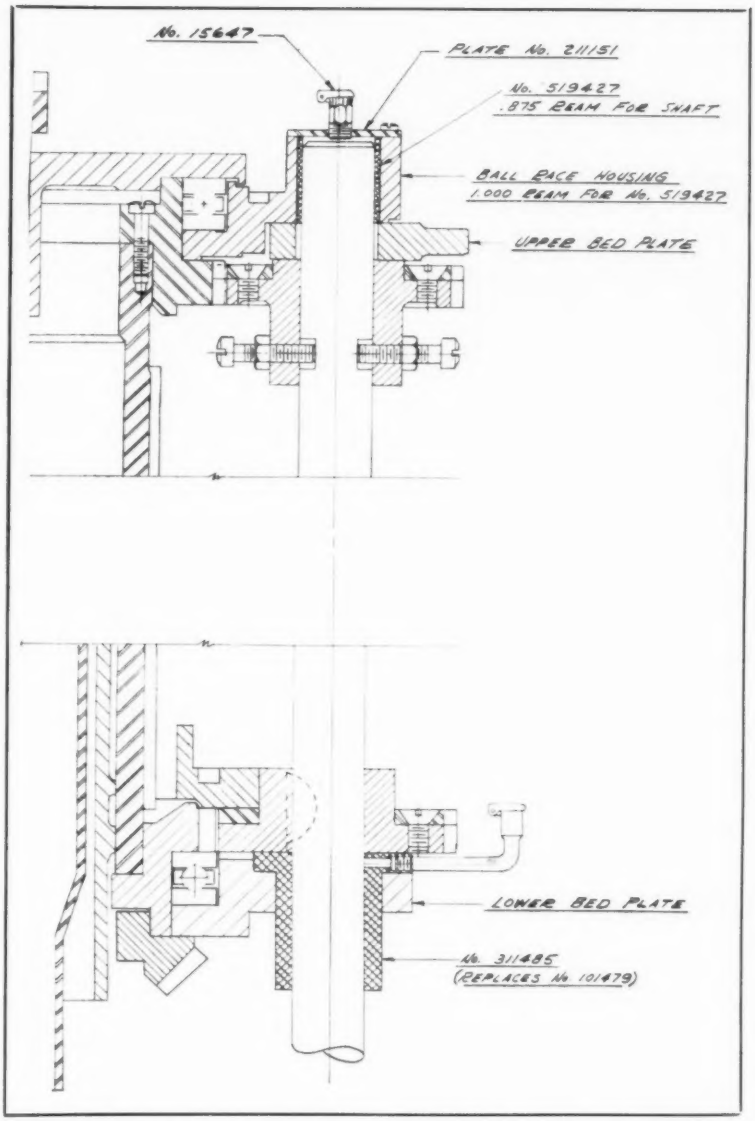
IT IS common practice for knitting machine builders to improve specific replacement parts for their machines from time to time, such parts being redesigned for the purpose of affording better service and longer life. The drawing on this page shows two Oilite replacement bushings (or bearings) for the vertical drive shaft on Scott and Williams' Komet machines.

The lower bushing replaces the old style cast iron bushing, and it requires no fitting or reaming. The bushing is installed in the usual manner.

The bushing in the upper race housing must be fitted. This means that the upper ball race housing must be bored to a press fit to accommodate the sleeve bushing; and after the sleeve is pressed into the housing, it may be necessary to ream the sleeve to get a perfect fit on the upper end of the shaft.

Boring the housing to accommodate the sleeve removes part of the screw holes of the old dust cap, so new holes must be drilled and tapped for the new dust cap. In some cases it may be wise to install a new shaft if the old one is worn sufficiently at both bearing points. If for some reason it becomes necessary to remove a worn vertical drive shaft, it would be wise to install the bushings at that time.

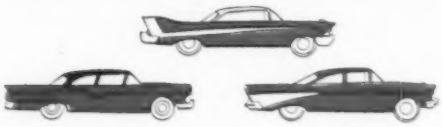
The safe way is to keep a few upper and lower bushings on hand so that when a vertical drive shaft begins to chatter, the new bushings can be installed to make the repair job first-class. The items are neither expensive nor difficult to install.



and faster speed, the main chain motion has been redesigned to provide adequate control of the camshaft during narrowing. The new motion is attached to both front and back beams and reinforced to insure accurate and positive control of all units actuated by buttons on its chain.

Interlock at Starting Course. Positive interlocking of the welt yarn before the hook-up course is provided for the purpose of preventing the cut end of the welt yarn from slipping back through several loops on the right end of the second knitted course. Its action prevents the dropping of hook-up course loops from the welt bar hooks and insures positive locking of the welt yarn to prevent unraveling of the end loops of the first knitted course.

In automobiles, it's "the big three"



In colored yarns it's

Franklin-Dyed

for:–

QUALITY

We dye exclusively on the Franklin compressible spring. This permits uniform density of packages, which promotes uniform penetration of the dye liquor and uniform shades.

SPECIALIZATION

Yarn dyeing is our specialty. We act as yarn merchants to get dyeing, but we don't dye to make yarn sales. Our 5 plants and our entire organization have but one objective—to provide the best yarn dyeing service available.

CAPACITY

With 5 dye plants, hundreds of package dyeing machines in dozens of sizes and winding equipment to match, we are literally the largest package dyers in the world — ready to dye all types of spun fibres in any quantity.

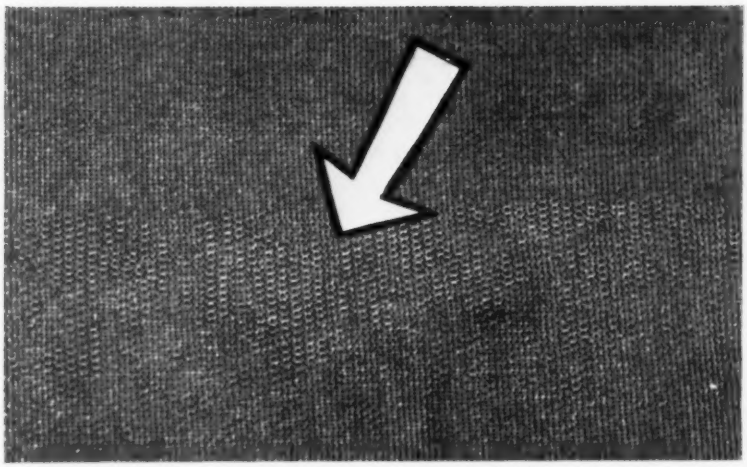
CONSULTATION

We can help you with your color problems. We have unequalled laboratory facilities, a staff of highly skilled technicians and unequalled experience in time, variety and volume which are at your service.

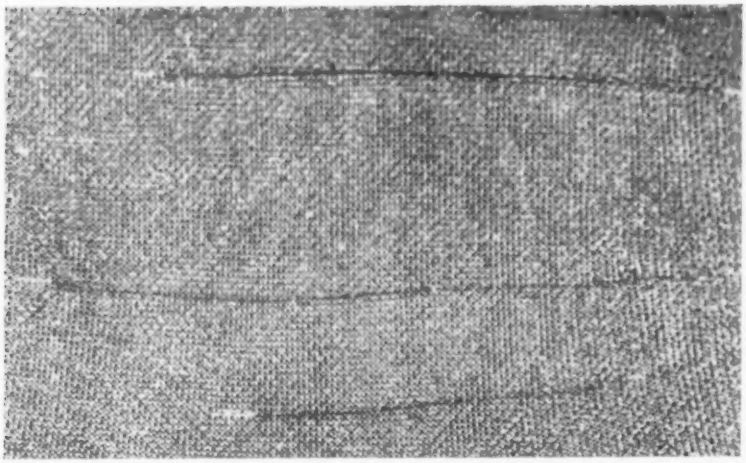
AVAILABILITY

Our 5 yarn dyeing plants, strategically located in 5 different textile centers, are conveniently yours. Contact our nearest plant or office.

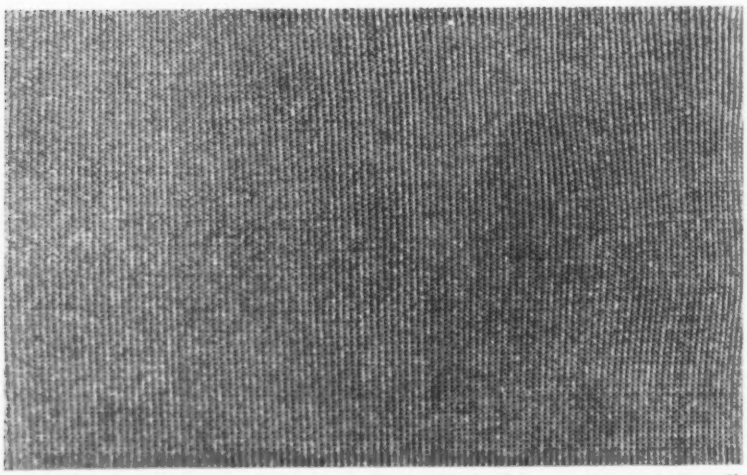
Franklin-Dyed
X-ray view of Franklin Package, the "secret" of uniform shades. Don't say "package dyed", Say "Franklin-Dyed".
Franklin Process
A DIVISION OF INDIAN HEAD MILLS
Dyers of cotton (carded, combed, mercerized) Orlon* (yarn & tow) Acrilan • Dacron** • Ban-Lon® • Helanca • Spun Nylon • Spun Rayon • Blends • Wool and Worsted yarn
Providence • Philadelphia • Greenville
Chattanooga • Fingerville, S. C.
New York Office — 111 West 40th Street
*Trademark for Dupont's acrylic fibre
**Trademark for Dupont's polyester fibre



Uneven draw-off often causes sleazy fabrics—watch needle height and knock-over setting.



Yarn skips may be caused by uneven tension on yarn, dirty yarn guides, bad carrier tubes.



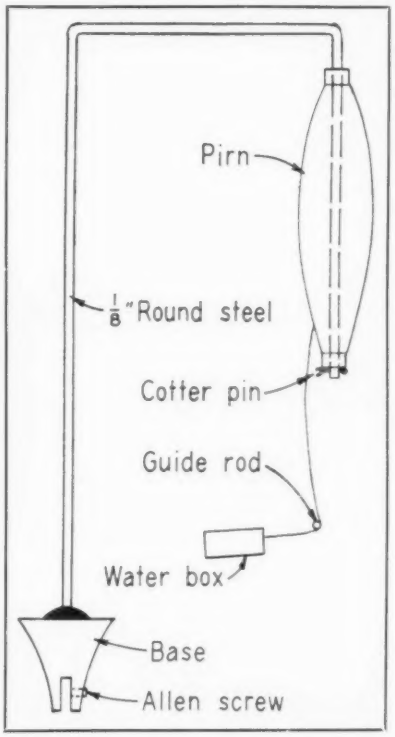
This first-grade fabric required correct needle height, knock-over setting, and draw-off.

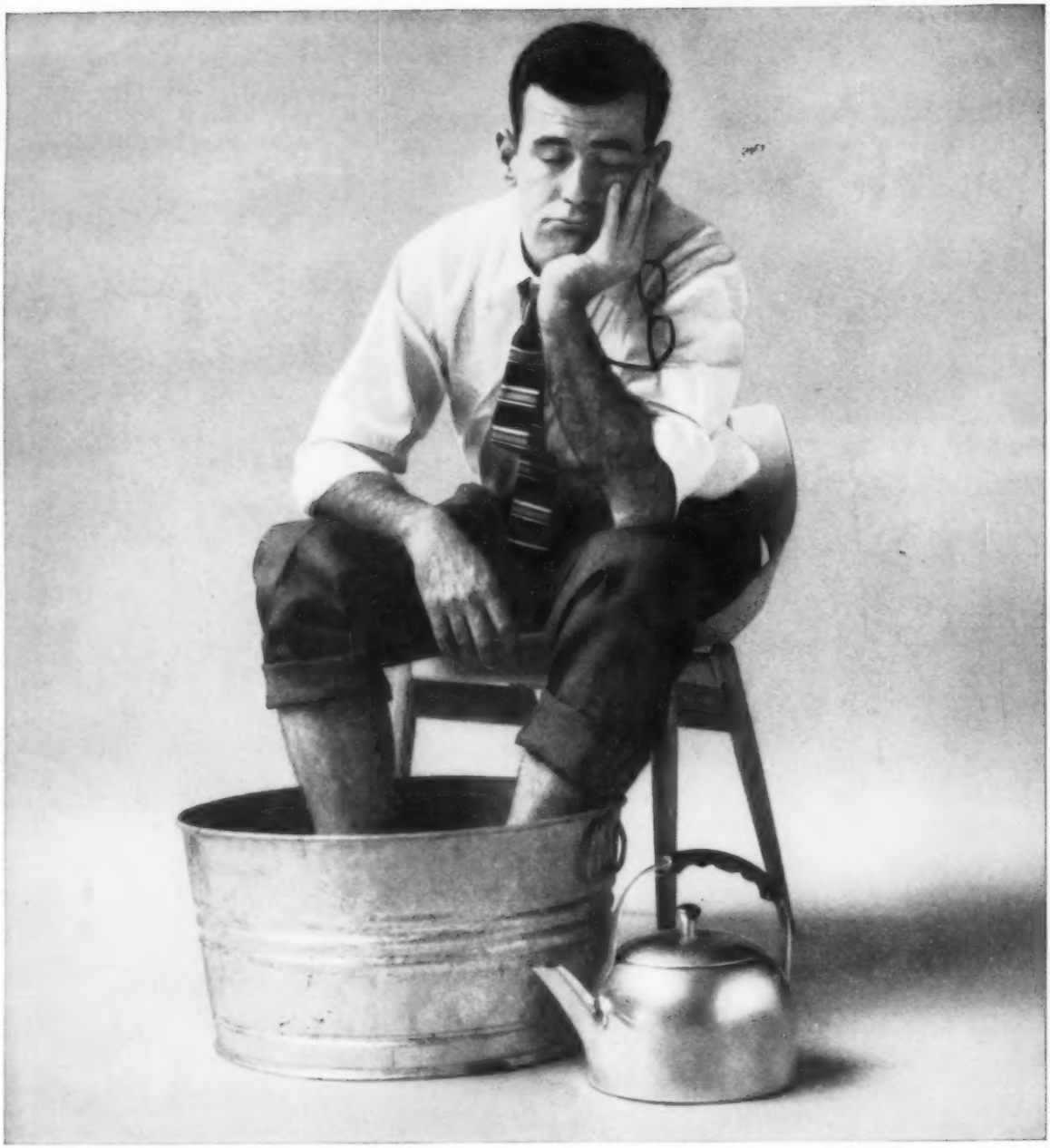
Pointers for twin-thread f-f knitting

by Walter B. Snow
Exclusive

UPON CHANGING a machine to twin-thread construction, the first requirement is to have all eyelets, thread guides, and carriers just as clean as you can get them. Of course, cleanliness is

This pirn holder can be easily made in the mill. Length and width of hanger will vary according to machine, method of threading.





DOG TIRED from looking for a good, dependable source for needles? Rest easy! For the finest quality needles for knitting, sewing, felting or tufting, just call . . .

THE TORRINGTON COMPANY

Needle Makers Since 1866

Torrington, Conn., U.S.A. • Bedford, P.Q., Canada • Coventry, England

Branches to serve you are located in: New York • Philadelphia • Chicago • Boston • Greensboro, N. C. Atlanta • St. Louis • Toronto, Ont., Canada • Broadgate House, 7-10 Eldon St., London E.C. 2, England
Pacific Coast Representative: E. G. Paules, 1762 West Vernon Ave., Los Angeles 62, California

important on any machine or style; however, it is especially essential on twin-thread construction.

Any twisted yarn will have a tendency to snag on dirt and separate, causing press-offs and cut holes. Also, it might tend to separate the twist yarn from the monofilament yarn and cause skips in the stocking.

The less jerking motion of the threads, the fewer skips you will have. Two helpful measures are to keep the snapper motion to a minimum while getting the desired effect from the snappers, and to have as little ring motion on the hairpins as possible. In fact, if you can get a good selvage without the use of rings and hairpins, the changes work very well without them.

As for the manner in which to thread the machine, we know this is a highly controversial issue, and you will hardly find two mills using exactly the same method of threading. No doubt there are several good ways of threading a machine. We hang the monofilament yarn and run it dry while putting the twist yarn at the front of the yarn box. The twist yarn is run through the trough solution, and this procedure gives better protection from the three hazards: press-offs, cut holes, and skips.

Conditions vary, depending upon the types of yarn used and denier of yarn. Pirn holders to hang your yarn can be purchased from Textile Machine Works or made from $\frac{1}{8}$" round stock steel (see illustration). Make the pirn holder so you will have from 4" to 6" drop from the pirn to guide rod or eyelet.

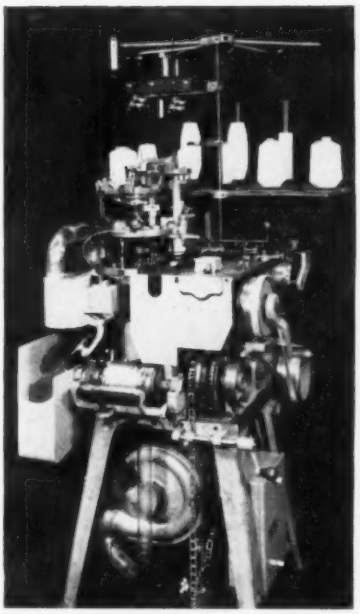
Proper gauging of needle height and knock-over setting is important to avoid sleazy knitting. Also, proper draw-off is necessary to get an even pull all through the stocking. Use a good cleaner and oil to eliminate machine roughness and to eliminate picks in the knitting field.

In manufacturing twin-thread stockings you have more of a quality problem, due to the delicate nature of the finer yarns used. Pull thread and pick hazards are greatly increased; therefore, it is important to give this phase a lot of attention and continued follow up, both in the knitting department and grey goods department.

Skips in yarn must be watched for carefully; this is not a problem on single thread styles. Handling is critical; delicate styles such as mesh or twin-thread must always be handled with extreme caution.

New ladies' seamless machine to be mill tested

■ WHILE the "Reading" MF-400 ladies' seamless hosiery knitting machine pictured here is still in the development stage, Textile Machine Works recently permitted members of the textile press to see it to illustrate the fact that the company is interested in building seamless machines.



The machine is being developed at the H. E. Crawford Co., Inc., plant in Kernersville, N. C., from which company the patents rights have been purchased by Textile.

While this knitter has not yet been released for sale, an experimental lot of 400-needle, 2-feed machines will undergo mill tests in the near future, after which Textile expects to go into full-scale production.

MORE NEW EQUIPMENT for the knit goods manufacturing industry is described in the "New Product Parade" section (pp. 165-179). TI's knitting mill readers will also find much helpful information in the special Man-Made Fibers section (pp. 69-114).—The Editors.

Don't sit back and wait for new business, Love warns

■ WHILE technical frontiers are pushing forward, day by day, the industry's equally restless marketing and merchandising frontiers still have a long way to go in making the American people "textile conscious to the extent that we want them to be," declared Spencer Love, board chairman of Burlington Industries, Inc., recently.

"Beyond the thousands of new industrial needs for textiles that have opened up new markets, we have a continuing challenge in the old and classical markets and methods. Markets, of course, will inevitably expand with the incredible rise in population."

He warned, however, that it would be a mistake for the industry to sit back and wait for population increases to bring new business, but urged it to "make better use of opportunities to serve present markets (1) by developing increasingly brilliant and original styles and designs, (2) by ingenious methods to increase per capita consumption of textiles, and (3) by improving the whole structure of merchandising practices."

"We have already brought about a price revolution in textiles," he asserted, "and fabrics of high quality, endurance, and style have been put within easy reach of the pocketbooks of all Americans."

Ingenious marketing of textiles to both old and new markets, in Mr. Love's opinion, can help reverse current trends of unsatisfactory textile profits.

SPOTLIGHTING THE NEWS

In Textile Chemicals

Here in capsule form are new developments in textile chemistry that can open additional avenues for investigation and analysis. There are ideas on how to improve products with chelating agents—hints on preservatives, better dyeing techniques. Here also are offered new technical bulletins on chemical products that can prove profitable to every textile manufacturer.

You may wish to check certain items in this advertisement and forward to those concerned in your own company.

Route to:

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ECONOMIES OF CHELATING AGENTS ATTRACT PROFIT-MINDED TEXTILE MEN

Since beginning to market Versene®, Dow has led the trend toward attractive price levels for chelating agents. As a basic producer of chelating agents, Dow is cooperating with textile men to make possible greater fiber production economies and efficiencies.

Why this strong belief in the future? Dow reasons that if a chemical product can be provided to save textile processors thousands of dollars by preventing spoilage of goods, by shortening processes, or by eliminating certain operations, the new plant facilities at Freeport, Texas are not a gamble—they are a smart investment!

One textile purchasing agent remarked, "This new plant means a sure, dependable supply of chelating agents —and at reasonable prices, too". For Dow's lineup of chelating agents and the problems they solve, see above right.

Proven applications are many—and are mounting. Removing impurities from wool before it is woven, inactivating iron, calcium and magnesium ions in the Kier boiling operation, simplifying peroxide bleaching, eliminating problems of discoloration and unevenness in rayon processing and textile dyeing lead the list.

The wide versatility of chelating agents is providing textile men with answers to problems of every kind and description.

PROBLEM	pH CONDITION	CHELATING AGENT
Iron and other metals in dyeing, scouring, stripping, and desizing operations.	2.0— 7.0	Versene* 100 (solution form) Versene Flake or Powder—Na_4 EDTA
Iron and other metals in dyeing, scouring, stripping, and desizing operations.	7.0—10.5	Versene* 100 (solution form) Versene Flake or Powder—Na_4 EDTA
Dyebath operations where highest purity chelating agent is required.	2.0— 7.0	Versene Acid—EDTA
Iron and other heavy metal ions in peroxide bleaching operations.	7.0—10.5	Versenex* 80 (solution form) Na DTPA
Only iron is a problem in dyeing or scouring.	5.5— 9.5	Versene Fe-3 Specific* (solution form)—Na DHEG
Iron and other metal ions in boil-off, kiering units caustic saturator box.	10.5 and above	Versene 100 or Versenex 80 plus triethanolamine.

*TRADEMARK

Wherever there are troublesome metal ions—wherever there are staining, bronzing, bleaching or tenderizing problems—and wherever there are dyeing and discoloration problems, Versene, Versenol® and Versenex are showing their value.

The faith and activities of many people represented by the new chelating agent plant at Freeport, Texas, attest to the fact that Dow believes in the textile industry and its ability to make effective use of chelating agents.

● STARTLING DYE SOLVENT

Makes colors brighter, deeper

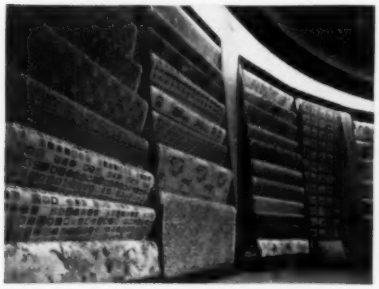
From the ranks of Dowanol® compounds (glycol ether solvents) steps Dowanol DE-SG, a modified version of Dowanol DE (diethylene glycol ethyl

DOW CHEMICALS
BASIC TO THE TEXTILE INDUSTRY

Glycol Ethers • Alkalies • Thickeners
Industrial Glycols • Glycerine • Chelating Agents
Ion Exchange Resins • Preservatives • Solvents • Polyols

ether). Used as a solvent with alkyd-containing pastes, Dowanol DE-SG controls evaporation, aids penetration and leveling.

One Georgia manufacturer who uses indigo type dyes almost exclusively remarked, "A small quantity of Dowanol DE-SG greatly increases the solubility of my dye. Result: Brighter colors and enhanced resistance to crocking."



Dye colors made brighter and deeper with Dowanol

Other manufacturers have found that when this Dowanol product is used in conjunction with triethanolamine in the production of denim, a color shade approximately 15 percent deeper than that gained through usual dyeing methods is obtained.

TYPICAL TEXTILE DYEING FORMULATION

Indigo Powder	10 ounces
Dowanol DE-SG	27 ounces
Triethanolamine	14 ounces
Sulfite Liquor	100 gallons

Complete data covering reactions, uses, analytical methods, toxicological and handling information on Dowanol compounds (the industry's widest line of glycol ether solvent) is found in Dow's new 52 page Dowanol booklet, available upon request.

★ ★ ★ ★

For further information on Textile Chemicals, contact Chemicals Sales Department 773T-1, THE DOW CHEMICAL COMPANY, Midland, Michigan.

*TRADEMARK OF THE DOW CHEMICAL COMPANY

YOU CAN

DEPEND ON

DOW

Proud **CAUSTIC** *shows youngsters fancy footwork*

Although not as glamorous as its younger relative, Versene, Dow's caustic soda still continues to play a major role in many textile manufacturers' bleaching, mercerizing and processing plans. And Dow caustic can make a boast of its own, not true of many of today's highly publicized and specialized "laboratory" chemicals—it is produced in four separate plants and is available from eight additional terminal points.

So when it comes to fast footwork—getting there on time ("I need it yesterday!")—no young upstart (or old-timer) is going to get there before Dow caustic!

other Dow chemicals

MAKING TEXTILE NEWS

CHLOROTHENE

This new, safer industrial solvent saves time and money in cold cleaning electrical equipment, machinery and small parts. Chlorothene® can be efficiently used for spray, bucket dip or wipe cleaning.

METHOCEL

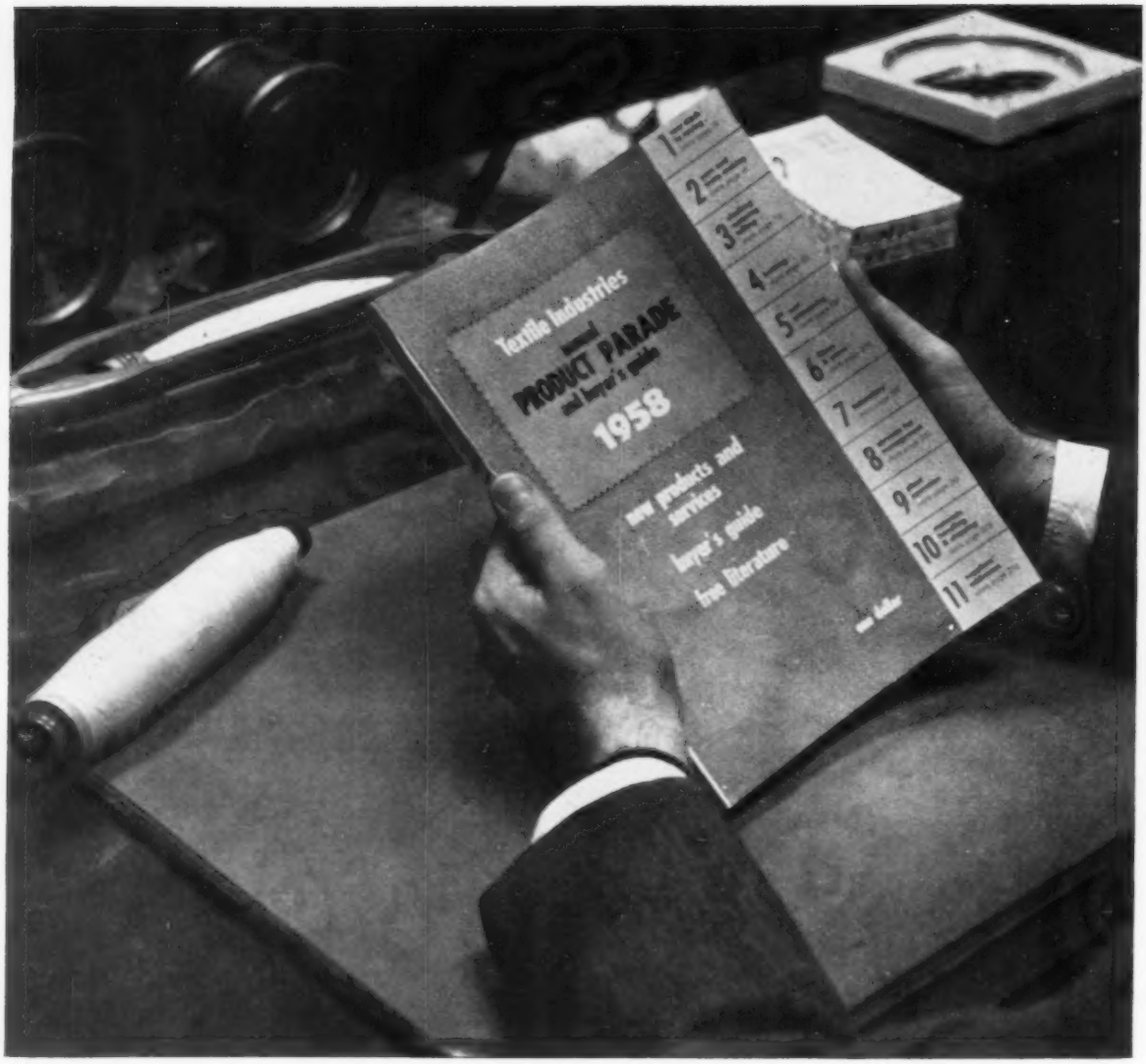
Industry's widest line of synthetic methylcellulose products reported on in new 60-page booklet. New, easier formulating techniques explained in detail—also three new products—Methocel® 60HG, 70HG and 90HG.

D WICIDE G

Economical preservative that protects water based sizing from spoilage. It's ı sported Dowicide® G is particular y useful in preventing mildew o ı sized warp yarns or grey goods w en stored. Fourteen formulations available.

POLYOLS

Many hundreds of Dow polyols available as humectants and solvents. New folder on "World's Widest Line of Polyols" gives further details on polyols, their properties and potential uses. Exciting possibilities promised by new "unheard of" polyols.



4 IN 1 PACKAGE for TEXTILE BUYERS

- New Equipment.
- Available Literature.
- Sources of Supplies.
- Advertising of Suppliers.

TI's Annual Product Parade includes the largest review of New Machinery, Equipment, Dyes, Chemicals, Fibers, Supplies and Services offered for the textile industry.

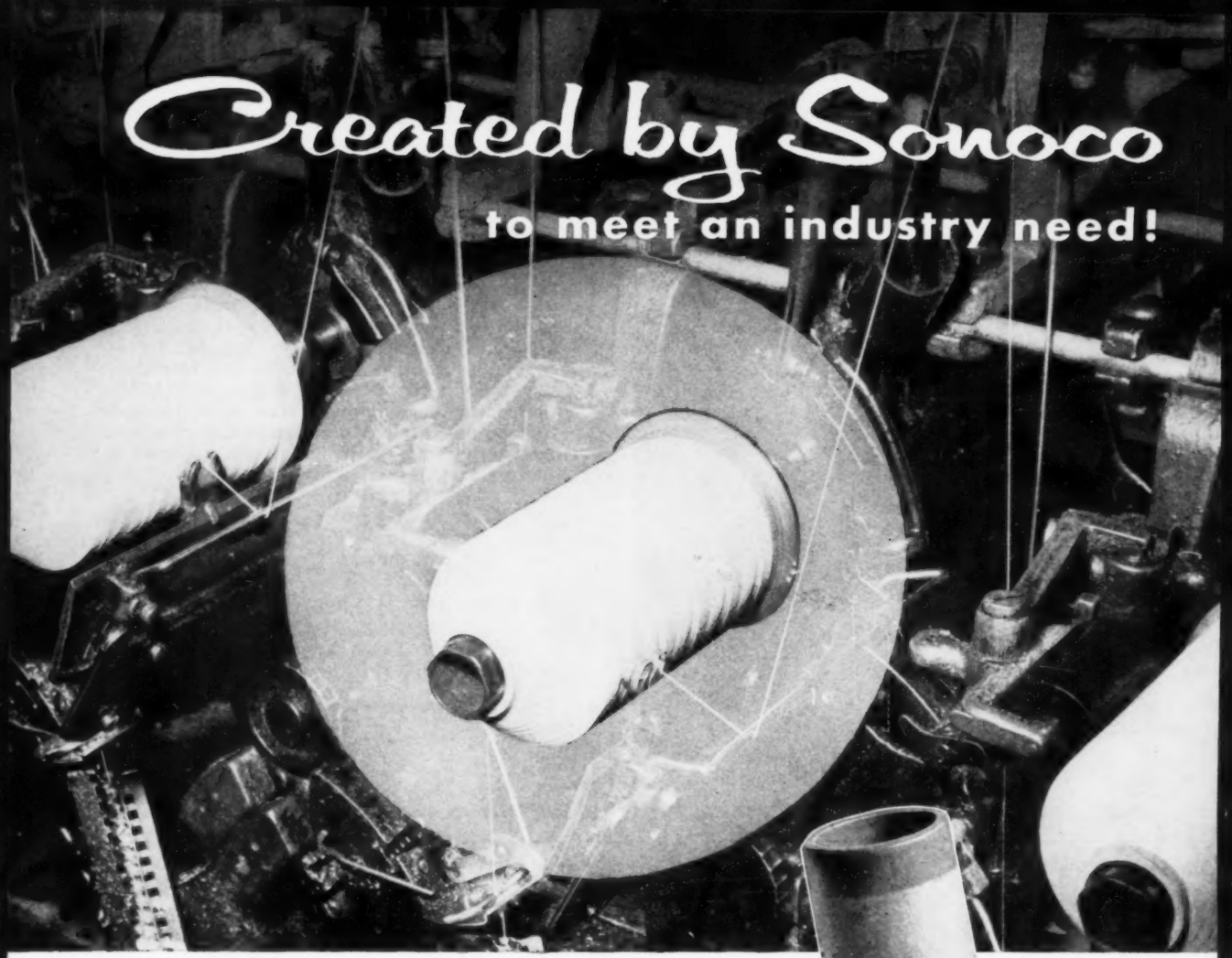
27,000 copies reach textile buyers throughout the world.

Indexed for easy reference and usage, it includes: Section 1—Raw Stock to Roving; Section 2—Yarn and Warp Making; Section 3—Slashing, Weaving, Tufting; Section 4—Knitting; Section 5—Wet Processing; Section 6—Fibers & Yarns; Section 7—Laboratory; Section 8—Services for Management; Section 9—Plant Operation; Section 10—Materials Handling & Shipping; Section 11—Suppliers' Addresses.

1959 Edition will be issued in Mid-November 1958. Closing date for advertising is October 20, 1958.

Created by Sonoco

to meet an industry need!



The need was for an economical industrial thread carrier. SONOCO answered this need with a "job-engineered", tapered base single head spool that would deliver free with uniform tension.

However, low cost is only one of the many benefits. The unique design, coupled with rigid quality control in manufacture, results in dependable performance for better packaging. These sturdy carriers protect both your reputation and your profits!

And, with SONOCO single head spools, you can select from a wide range of research-developed surfaces. Barrels may be plain, ground, scored, and colored lacquer tips can be applied for identification.

For nearly 60 years, SONOCO has supplied the industry with dependable, low cost paper carriers. Let this experience help you!

SONOCO

Products for Textiles

SONOCO PRODUCTS COMPANY

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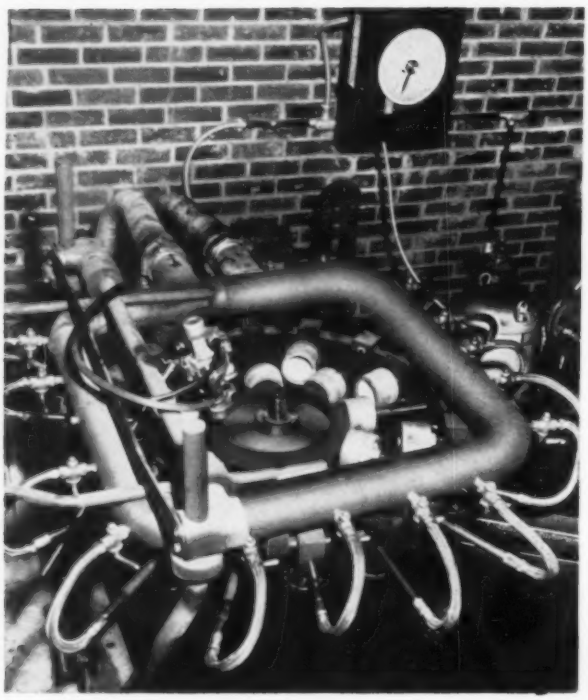
1650

. . . add YEARS to your GEARS!



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★ Now you can have heat-treated steel gears giving FOUR TIMES more life than similar gears which are untreated or poorly treated.

★ The new completely scientific heat-treating installation shown here, assures uniformly hardened gears up to 17" diameter by 6" face. The gear is rotated in electronically controlled radiant heat, thus providing 100% uniformity of treatment from gear to gear as well as from tooth to tooth. Only the web and bore remain soft, insuring a minimum of distortion.

★ Get information or quotation about the Ferguson Gear process that will save you trouble, time and money. Contact your nearest Ferguson Sales Engineer, or write direct to Ferguson Gear Company, Gastonia, N. C.

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SALES OFFICES { GREENSBORO, N. C. — R. T. GLADDEN; GASTONIA, N. C. — R. W. LYNCH TEL. 3-2662 DENVER, N. C.; GREENVILLE, S. C. — HAROLD H. HARRISON; LA GRANGE, GA. — JOHN FERGUSON TEL. 5040, P. O. BOX 486

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Exceptionally effective in high speed continuous desizing ranges due to its built-in heat stability.

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PABST BREWERIES

Write for Free Information on Johnson Textile Machinery Replacement Bearings

The ordering of maintenance material for textile machinery is simplified with this new Johnson folder which illustrates and describes a wide range of bearings for several leading makes of textile equipment.

You can order in confidence for Johnson Bearings are made to the exact specifications of the original equipment. The design of each bearing, its alloy, size-tolerances and oil grooving all are identical with the bearing to be replaced.

For your free copy of this Johnson Textile Bearing Folder JBL-9, write Johnson Bronze Company, 530 S. Mill Street, New Castle, Pa.

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LIQUID SULFUR DIOXIDE

HIGHEST QUALITY

SO_2

For Effective Removal of RESIDUAL CHLORINE

Tennessee's Liquid Sulfur Dioxide Is a Most Efficient and Economical Antichlor

SO_2 accomplishes the following—Acidifies alkaline hypochlorite making it easier to wash out. Reduces chlorine to the harmless valence minus one (Cl^{-1})! Leaves fabric acid free.

Tennessee's Liquid Sulfur Dioxide is also very effective as a reducing, bleaching and neutralizing agent, and pH control.

Available In:

- CYLINDERS
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We would like to consult with you on the possibilities of Tennessee's Liquid Sulfur Dioxide in your processing.

TENNESSEE TC CORPORATION

617-29 Grant Building, Atlanta, Georgia

New! HUNTER *Jet Stream* TENTER HOUSING PROVED BEST IN SIDE-BY-SIDE MILL TEST!

Actual mill tests, just completed, prove the Hunter Jet Stream Tenter Housing *your best buy* . . . for drying uniformity, speed and operating efficiency. In these controlled tests, 3.75 yard sheeting was run through a 70′ Jet Stream Housing with 125 lbs. total steam pressure . . . alongside a model of the finest equipment previously available, operating under the same conditions. Against the competitive machine's 135 y.p.m., *the Hunter Jet Stream dried 145 yards of cloth every minute in this actual side-by-side run.*

The Jet Stream's superior performance is the result of advanced aerodynamic features which control the direction and velocity of airflow for complete drying uniformity across the entire width of the cloth. Newly-developed nozzles, coupled with special distributing vanes within the plenum chambers distribute air proportionally across the full width of the Tenter Frame after it has been drawn in by the penthouse fans. A newly-designed air-return system allows large volumes to be moved at low velocity . . . prevents migration problems that result from uneven drying of the sides of the cloth.

You can introduce the profitable advantages of faster, more uniform cloth drying . . . and greater operating and maintenance economy . . . to your mill now. Get full details on the new Hunter Jet Stream, the fastest, most efficient Tenter Housing in mill operation today. Write for the new Hunter Bulletin JS.

JAMES HUNTER

JAMES HUNTER MACHINE COMPANY • NORTH ADAMS, MASS.

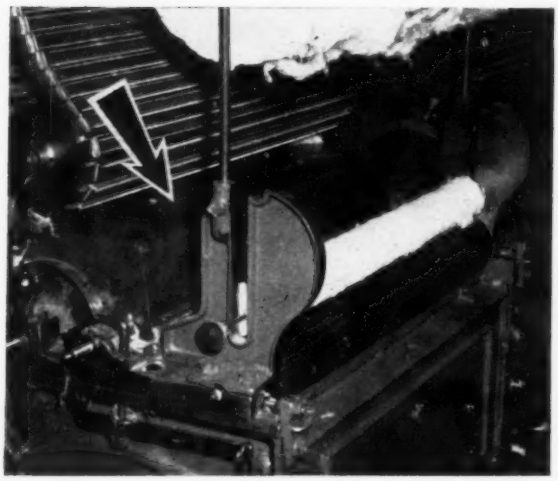
Member of American Textile Machinery Ass'n.

Subsidiaries: *James Hunter, Incorporated, Greenville, S. C. • Hunter Fiber Machine Co., Los Angeles, California*
Thomas Leyland Co., Readville, Massachusetts • Hunter Controls, North Adams, Massachusetts

NEW PRODUCT PARADE

Machines and Equipment . . . Supplies and Services . . . Dyes and Chemicals . . . Books

Please note: Claims made in all of these announcements of new developments are of necessity based upon information furnished by the respective suppliers.—The Editors.



Card waste cutting licker-in cover

Commercial availability of the "Turbaire" cleaner, the replacement for cotton card licker-in covers which was reported to have reduced a mill's card waste 80 per cent (see TI for Nov. 1957, p. 122), has been announced.

Lower grade waste, containing more motes, leaf, and other foreign matter, is produced by cards equipped with the device which is a metal cover with a series of baffles that break up the boundary layer of air and control it to give more efficient cleaning. Yet, neither yarn grade nor strength are affected, mill tests indicate.

Experience with this new licker-in cover, which has no moving parts and thus requires no maintenance, indicates that the device is well adapted to the extra long staple, roller gin varieties of cotton, such as Karnak, Sak, Pima, and Supima.

Dixie Textile Sheet Metal, Inc., 509 E. Main Ave., Gastonia, N. C.

Do you want more data? Write ◂ or use card on page 181; list H-101

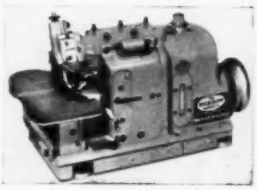
Twister has spindle speed of 60,000 rpm

The CrimpSpin-3 false twist machine described in TI for October, 1957, p. 187 is now equipped with a modified false twist spindle for operating at a guaranteed speed of 60,000 rpm. This represents a production increase of 50% over its most recent prototype. The spindles have a life expectancy of approximately three years, a low replacement cost, are grease sealed, and require no maintenance. The equipment is made by Ernest Scragg & Sons, Ltd., Macclesfield, England.

International Sales Management Co., 123 N. Poplar St., Charlotte, N. C.

Do you want more data? Write ◂ or use card on page 181; list H-102

Machine closes loopless stockings



A two-needle, three-thread sewing machine for closing toes on the Getaz loopless stockings produces a flat butted seam which cannot be felt by the wearer. Designated the M-4D-45, the machine is in the Class M series of automatically lubricated sewing machines.

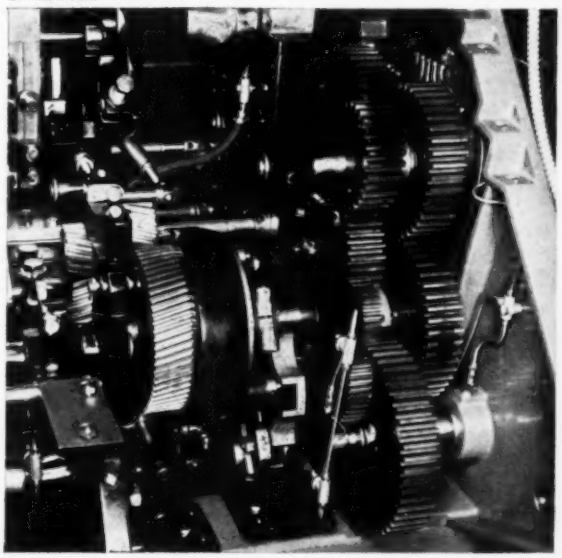
The Merrow Mch. Co., 28 Laurel St., Hartford, Conn.

Do you want more data? Write ◂ or use card on page 181; list H-103

Newest motions available for older combers

A changeover, which includes an epicyclic roller motion, gives to the older comber Models 50, 52, and 54 the performance and advantages incorporated in the newer Models 56 and 57. (The model 56 represents improvements which permitted nips per minute to be increased from 106 to 126, without any drop in sliver quality, and job loads in some cases to be increased from six to eight combers per tender even with the 20% increase in each comber's production. The Model 57 differs from the Model

Production of Saco-Lowell Models 50, 52, and 54 combers can be increased by equipping them with an epicyclic roller motion like the one shown in this photo of the head end on the No. 2 side of a Model 57 comber.



LET HERR ENGINEERS

Solve Your Spinning and Twisting Problems

For 6 oz. Wool and Dacron Blends. 5/16" Face Conical Ring. The most popular ring to produce light count yarns at high spindle speeds.

For Medium Counts. 3/8" Face Conical Ring for worsted, orlon, nylon, dacron and blended yarns of all types.

For Medium to Heavy Yarns. 43/64" Face large diameter Conical Ring. An excellent ring for spinning and twisting wool, synthetic and fiberglass yarns for carpeting, tire cord, woolens and novelty weaves.

Extra light weight bobtail flyer used on light denier yarns.

Take your problems to the HERR experts. You will get the correct answer faster than by experimenting. New fibers... new physical characteristics, require changes in processing. Herr Conical Ring and Traveler combinations can be provided to give you complete control of the yarn. You'll find it a lot easier to let HERR Engineers solve your twisting and spinning problems.

HERR

MANUFACTURING CO., INC.

310 FRANKLIN STREET, BUFFALO 2, NEW YORK

FOR SPINNING AND TWISTING WORSTED, WOOLEN, RAYON, NYLON, ORLON, FIBERGLASS AND BLENDED YARNS OF ALL TYPES

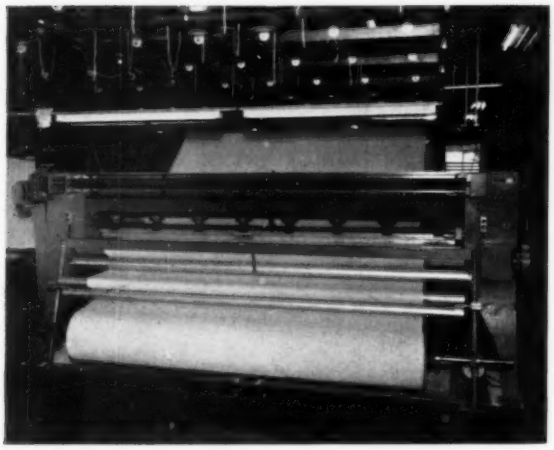
56 in structural changes which increased the life of many machine parts.)

Other parts or motions involved in the changeover include: automatic top and bottom clearers; four over five draw box to reduce sliver variations; nipper frame compression, not tension; antifriction coiler; and automatic lubrication. The latter is in effect a motor-driven metering system, which lubricates every bearing its required amount every 72 minutes, protected by a pressure gauge to warn of bearing abuse if a lubricant line breaks. Grease is used to lubricate the antifriction bearings incorporated in the top detaching rolls of the draw box.

Saco-Lowell Shops, 60 Batterymarch St., Boston 10, Mass.

Do you want more data? Write ◂ or use card on page 181; list H-104

Tufts in either cut or loop pile

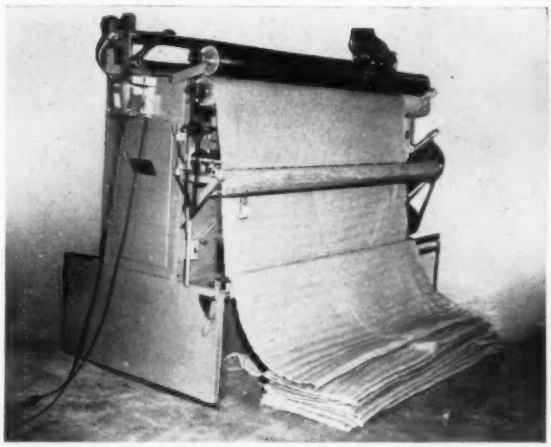


A loop/cut tufting machine that produces either loop or cut pile from the same needle, uses only one cut pile hook. By combining the machine with the universal type pattern attachment, designs can be made in relief or sculptured pattern. High portions of the pattern may be produced in cut pile in combination with low areas in loop pile. The cut and loop pile areas may approximate the same height, if desired. (The loop/cut principle was used in tufting the title page of the tufted section of the June, 1958, issue of TI.) It will produce any design—repeat or medallion patterns, floral, or geometric. It is never necessary to rethread the machine to change patterns, changing only the pattern drum being sufficient.

An individual loop stripper finger works with each cut pile hook. Through the use of solenoids, the loop stripper fingers can be actuated to work individually or collectively by electrical pattern drum control. The machine is set to make cut pile, and when the pattern calls for loop pile, the loop stripper finger pushes the loop off the hook before it is cut. By combining the machine with the universal pattern attachment, which controls the amount of yarn fed to the needles, it is possible to control the height of the pile formed in either the loop or cut pile. Normally the electrical control of the universal pattern attachment is wired into the control fingers of the same pattern drum as the loop mechanism. Consequently, one pattern drum controls two operations—formation of the design in cut or loop pile, and control of the portions of pile made in high cut pile and low loop pile.

Cobble Bros. Mchy. Co., Inc., Riverside Dr., Chattanooga, Tenn.

Do you want more data? Write ◂ or use card on page 181; list H-105



Cuts cloth to length, slits it to width

An automatic cutting machine that will slit a width of fabric, leave the cut-away portion intact for rolling up, and cut to length the remainder of the cloth width is available in several widths. Production, dependent on cloth width, is up to 20 pieces of 72" fabric per minute—traverse time of the cutting element is from three to seven seconds. Feed roll speeds may be varied from very slow rates to 60 yards per minute, and are changed by switching V-belt pulleys. The machine can be stopped and started instantly without sacrificing accuracy of the cut.

Primarily designed as a cutting machine (the slitting attachment is optional), the units are made in standard widths to accommodate 90" fabrics but may be made to cut fabrics of any reasonable width.

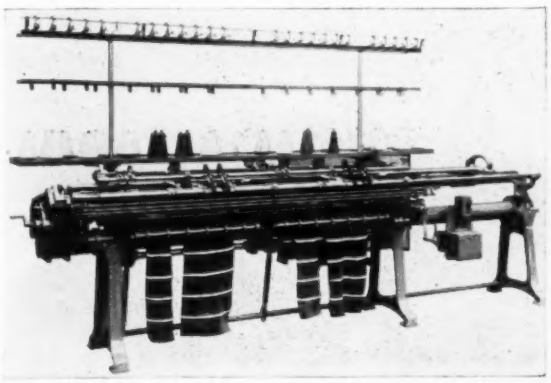
Nemo Industries, Inc., 3081 Maple Dr., NE, Atlanta 5, Ga.

Do you want more data? Write ◂ or use card on page 181; list H-106

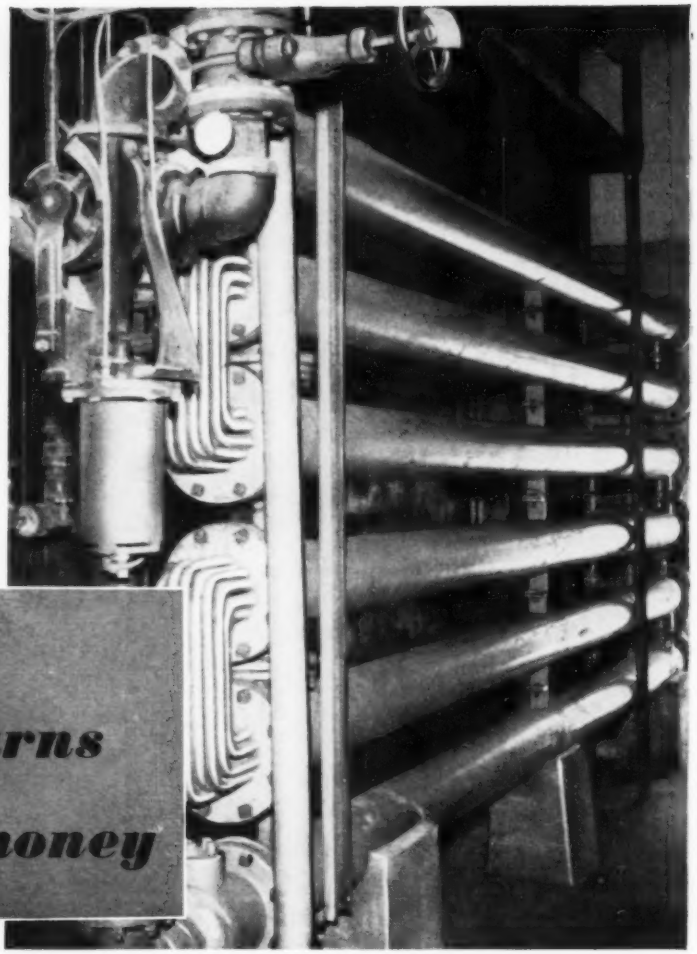
Border knitter triples output of single-lock unit

The Swiss-made Schaffenhausen flat power knitter is fully automatic, fast, versatile, equipped with high and low butts, is made in gauges from 7 to 20, has two heads and double locks. Estimated production per hour: full-width ribs, 80; knitting in two sections, 160; knitting in three sections, 240.

Called the MDA-2, the machine has, among others, these features: high capacity for producing borders and



only a Ludell system of recovering heat from polluted waste water gives you



the most $ returns for your money

A SYSTEM for recovering heat from polluted waste water should be *engineered* to your plant's needs to produce the greatest fuel economy and maximum in boiler h.p. recovery. It should be expansible to take care of future needs, clean itself automatically and provide for chemical cleaning when needed. *Only a Ludell System* gives you these advantages and cost-saving benefits.

Ludell Systems of Waste Heat Recovery are saving hundreds of thousands of dollars every year for textile mills and laundry plants from coast-to-coast. Replacement of old-style and out-moded heat exchanger equipment is justified on the basis of actual fuel-savings alone. It will pay you to investigate the full advantages of a Ludell System of Waste Heat Recovery in your plant.

Ludell
Manufacturing Company
5200 West State Street • Milwaukee 8, Wis.
Representatives in the United States, Canada, Alaska

MANUFACTURERS OF BREADY SYSTEMS OF HEAT RECOVERY AND HOT WATER HEATING • WATER HEATERS • STORAGE TANKS • WHEELER SELF-UNLOADING WASHER

WRITE FOR ILLUSTRATED BOOKLET. This booklet contains factual information which should be in every plant engineer's data file. Dept. T.I.

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collars in 1:1, 2:2, and other ribs and fancy stitches; only 2½" needle loss between two ribs sections on each head; rib length knitted with double lock; four needle beds, each 29½" long; racking of back needle beds over eight needles to the right and left; semi-long carriage with two double cardigan cam locks with auxiliary cams allowing the yarn to be guided directly to yarn carriers; automatic movements controlled on both heads on either side; pattern disk constructed so that a repeat pattern is set only once; twelve tensions per head with electric stop motions for damaged or broken needles, yarn building up and press-offs; and only one operation is required to change pattern.

Robert Reiner, Inc., Weehawken, N. J.

Do you want more data? Write ◂ or use card on page 181; list H-107

F-F sinker heads reconditioned with nylon inserts

A reconditioning service which supplies nylon inserts and nylon presser edges offers a one-year guarantee against defective material and workmanship. Experiments have shown that nylon presser edges have remained in operation under mill conditions for more than five years without showing more than negligible wear, and that sinker heads with nylon inserts have been in operation under mill conditions for more than two years without showing more than negligible wear on the presser edge and in the slots. Needles used in those experiments showed definite reduced needle beard wear.

Textile Machine Works, P. O. Box 1382, Reading, Pa.

Do you want more data? Write ◂ or use card on page 181; list H-108

Speeds cleaning in textile mills

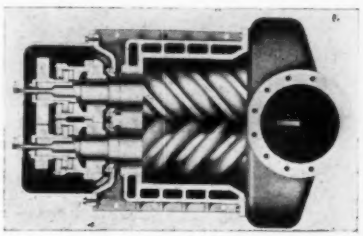
The portable, heavy-duty Hot Shot Steam Cleaner that operates on electric power and carries its own water supply is designed specifically for the indoor cleaning of machines, equipment, fabrics, and fabric work surfaces in textile plants. It humidifies, creates dry steam which minimizes water flooding, and can be used to operate steam irons and presses when not in use as a cleaner.

Equipped with nickel-bearing stainless-steel fittings, its own water reservoir, and designed for long, corrosion-free life, it is made in three power sizes to meet varied textile plant needs. The pump and motor are contained in one package unit that can be moved by hand.

Automatic Steam Products Corp., 140 West 31st St., New York, N. Y.

Do you want more data? Write ◂ or use card on page 181; list H-109

Compact compressor with big lungs



The compactness and low maintenance features of a series of positive-displacement rotary air compressors are designed to rival the efficiency and stability of reciprocating machines. With a standard single-stage capacity of 800 to 13,000 cfm (other capacities custom designed), the compressors have application both in pressure and vacuum systems. They can be powered by induction or synchronous motors, diesel or natural gas engines, or steam or gas turbines. Compactness permits savings in weight and floor space.

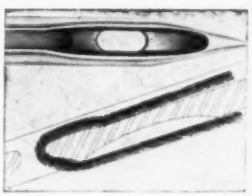
The compressor is a two-impeller, helical-lobe-type, axial-flow rotary machine with four-lobe power impeller and a secondary impeller with six matching gaps synchronized by timing gears. Power is transmitted to the secondary impeller through the cushion of compressed air. There is no metal-to-metal contact between the impeller or with the surrounding casing. Impeller oiling is therefore unnecessary, preventing contamination of the air, gas, or vapor.

Maximum discharge pressure of single-stage machines is 60 psig. The two-stage compressors, with external intercoolers, offer compression ratios up to 11 to 1 and can raise a product from atmospheric pressure to 150 psig.

Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

Do you want more data? Write ◂ or use card on page 181; list H-110

Needle designed for wash-and-wear sewing



Puckering and seam weakness in wash-and-wear garments are minimized with the use of the Excelsior Struck Groove Needle, made for high speed stitching. A slim needle, equipped with ball point which slides between the yarns rather than through them, and designed for maximum strength, its construction insures that the spot or hook clearance is accurately located with respect to the eye—maximum clearance is maintained between the thread and the bottom of the spot so that stitches will not be skipped even though a poor thread loop is formed.

The Torrington Co., Field St., Torrington, Conn.

Do you want more data? Write ◂ or use card on page 181; list H-111

The Laurel Leaf

BUSINESS MAGAZINE EDITION

ACCLAIMED!

LAURAMINE RT . . .

ANIONIC SOFTENER

No single Laurel product has won such wide acclaim by the industry in so short a time as our recently-introduced Laurel LAURAMINE RT. It is an anionic softener, recommended for finishing **all** types of yarns and fabrics . . . especially cottons and rayons.

A soft, white paste, Laurel LAURAMINE RT gives a full, soft hand, improves the drape of cloth, imparts excellent lubrication to improve cutting and sewing properties, and gives napping qualities that add a distinct **plus** to fabrics. It has excellent ageing resistance, and **no effect** on shades of dyed goods.

Users also approve Laurel LAURAMINE RT for the **ease** with which it's handled. Predispersed, there's no messy preparation. And, it's compatible with most common finishing agents except cationics.

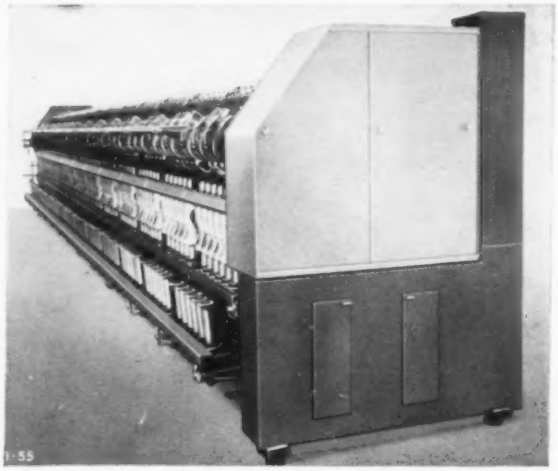
You, too, will acclaim Laurel LAURAMINE RT the first time you try it. Send for a free sample, and discover all the ways that Laurel LAURAMINE RT can benefit you. No obligation, of course.

Laurel Brand

Laurel SOAP MANUFACTURING CO., INC.
TIOGA, THOMPSON & ALMOND STS., PHILA. 34, PA.

Warehouses:
Paterson, N. J., Chattanooga, Tenn., Charlotte, N. C., Greenville, S. C.

Tufted carpet yarn system has auto-doffing spinner



78-spindle, 4¾" pitch automatic doffing gill spinning frame, with Baxter type flyers and built-in Pneumafil system

In response to the demand for a non-felting, long-wearing carpet, James Mackie & Sons Ltd. developed a complete tufting yarn system for the production of gill spun yarns from rayon, acetate, crimped nylon, etc., staple ranging in size from 4 to 50 deniers and in length from 4 to 8 inches. High efficiency at the tufting operation is obtained when using yarns made by this system.

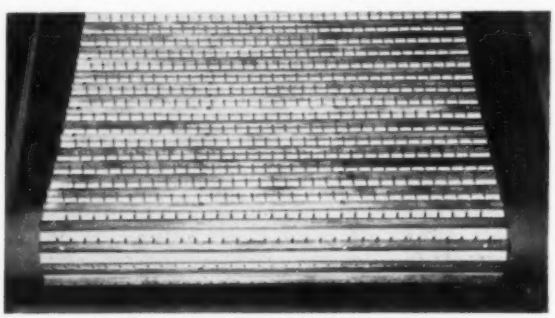
Machines included in the system are: a card fitted with automatic hopper feed, an intersecting drawing frame that accommodate up to 12 ends of sliver (single and dual delivery units available), automatic doffing gill spinning frame with pin control, a winder, and an automatic doffing tag end twister.

James Mackie & Sons, Ltd., Belfast, Northern Ireland.

Do you want more data? Write ◂ or use card on page 181; list H-112

"Soup to nuts" materials handling aprons

Slat and spike aprons for materials handling are available in a wide variety, two of which are called the A-14 uphill spike type and the R-143 hardwood plain slat type. With the complete units are available shafting, pulleys,



Chain-back, spike-slat apron with hard maple slats.

sprockets, chain, and belting. Installations are to be made by plant personnel. A consultation service is also furnished to help meet special apron needs.

Sims Metal Works, West Point, Ga.

Do you want more data? Write ◂ or use card on page 181; list H-113

Long-life twister bobbins doff easily

Easy doffing, longer spool, bearing, and spindle life, greater concentricity, and finer balance are among the many advantages offered in a series of textile spools. By holding the finishes and tolerances of the spindle tube bores to plus or minus 0.0005", corrosive fretting is reduced to negligible amounts and increased bobbin and spindle life result.

Akron Spool & Mfg. Co., 410 Progress St., High Point, N. C.

Do you want more data? Write ◆ or use card on page 181; list H-114

New yarns and fibers

Polypropylene yarn is an extruded yarn with many industrial uses such as in rope and wet and dry filter elements. Usable also in many fabrics now containing such synthetics as nylon, saran, and polyethylene filaments, it is designated Reevon Series 800 Polypropylene Monofilament. Available in single-strand sizes ranging from 0.004 to 0.020 mm in diameter, and in multifilaments ranging from 0.003 to 0.008 mm for each filament, may be selected with round, flat, or elliptical cross sections. Other shapes can be made on request.

Reeves Bros., Inc., 54 Worth St., New York 13, N. Y.

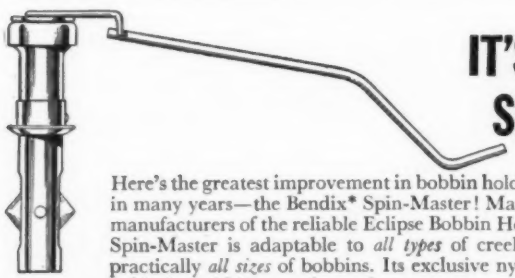
Do you want more data? Write supplier or use card on page 181; list H-115

Two synthetic yarns for tufted floor coverings are prepared as twist-set yarns, one from a blend of nylon and the acetate carpet staple, Celaire. Called US 100ⁿ and US 200ⁿ, the former is an all-nylon yarn. With the twist permanently locked in during the setting process, the yarns give up to 20 per cent more coverage and are offered in a variety of twists for a wide range of textured surfaces.

Note difference in tufted carpeting made from U. S. Rubber's twist set yarn (at left) and one made from another twist set yarn. Here the samples are folded back to show single row of pile yarn which demonstrates the density obtainable from either of the new yarns announced by U. S. Rubber.

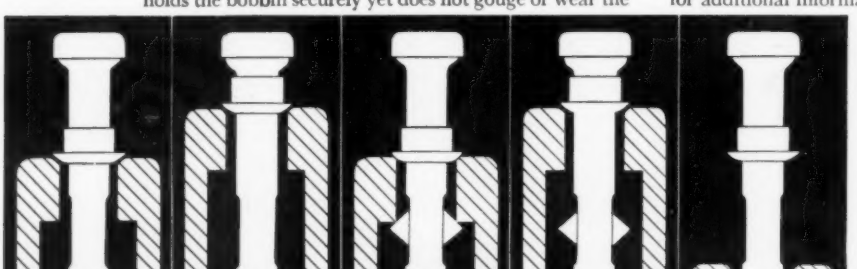
United States Rubber Co., Textile Div., Rockefeller Center, New York 22, N. Y.

Do you want more data? Write supplier or use card on page 181; list H-116



IT'S HERE! THE ALL-NEW BENDIX SPIN-MASTER BOBBIN HOLDER!

Here's the greatest improvement in bobbin holder design in many years—the Bendix* Spin-Master! Made by the manufacturers of the reliable Eclipse Bobbin Holder, the Spin-Master is adaptable to *all types* of creels and to practically *all sizes* of bobbins. Its exclusive nylon latch holds the bobbin securely yet does not gouge or wear the bearing surface. Because of its unique design, the Spin-Master makes creeling a one-hand operation. Its extra-free rolling action is superior to that provided by any other bobbin holder. And, of course, it is thoroughly corrosion resistant. Order today, or, if you prefer, write for additional information. *REG. U.S. PAT. OFF.



Bobbin holder slides easily and freely into top of bobbin. Nylon latch is concealed within the barrel of the holder.

Bobbin is pushed up against collar of bobbin holder. At this point, latch is still concealed inside the bobbin holder.

As bobbin is allowed to drop, collar of bobbin holder slides down to original position and latch snaps into place, suspending bobbin.

To release bobbin from holder, the bobbin is again pushed up, raising the collar of the holder. Latch is still securely in place.

When bobbin is again allowed to drop, latch retracts into body of bobbin holder, so that bobbin may be easily removed.

- Eliminates Bobbin Wear
- Easy, One-Hand Creeling
- Fits All Standard Creels and Bobbins
- Easy-Rolling, Stainless Steel Bearings

Bendix-Elmira, N. Y.
ECLIPSE MACHINE DIVISION

Bendix AVIATION CORPORATION

DISTRIBUTED BY: Southern States Distributors, North Carolina, South Carolina, Va., Ala., Ga., & Tenn. • Greenville Textile Supply, Greenville, South Carolina • Odell Mill Supply, Greensboro, North Carolina • *Export Sales:* Bendix International Division, 205 East 42nd Street, New York 17, New York.

In other areas write to:
Eclipse Machine Division, Bendix Aviation Corporation, Elmira, N. Y.

New yarns and fibers *(continued)*

The metallic yarn called Ultra-Vat is Mylar based and has all the properties of Metlon-with-Mylar plus a sharply increased reading to carbon arc and sunlight testing. More than 300 hours in the Fade-Ometer have produced no appreciable change. More than usually resistant to bleaching, mercerizing, vat dyeing, and to compressive shrinking, it will also resist carbonizing temperatures and processes and vulcanizing. Recommended for automotive upholstery fabrics, plastic fabrics for out door furniture, awnings, and beach and garden umbrellas.

Metlon Corp., 432 Fourth Ave., New York 16, N. Y.

Do you want more data? Write supplier or use card on page 181; list H-117

A low-melting, thermoplastic binder for nonwoven fabrics is manufactured as an undrawn, uncrimped Dacron staple with an average denier per filament of about eight to ten inches. Available in a cut length of 1½", and known as Dacron polyester fiber-binder, it permits nonwoven fabrics to be made 100% of that fiber. The fiber-binder may be blended with conventional Dacron staple and may be processed on conventional web-forming equipment such as cards, garnett cards, or air deposition units.

E. I. du Pont de Nemours & Co., Inc., Textile Fibers Div., Wilmington 98, Del.

Do you want more data? Write supplier or use card on page 181; list H-118

A continuous filament yarn with randomly spaced slubs of irregular size and shape, called Ondulé rayon, is lustrous and has a very strong resemblance to Douppione silk in both yarn and fabric forms. Available in the following deniers and filaments, all bright: 150-60; 250-90; 450-130; 1100-360; and 2200-720.

E. I. du Pont de Nemours & Co., Inc., Textile Fibers Div., Wilmington 98, Del.

Do you want more data? Write supplier or use card on page 181; list H-119

Carpet rayon staple, long wearing and soil-resistant, is available under the trade name of Super L, part of the Colorspun family. Eight basic colors, in most-wanted carpet shades, are offered. The yarn wears about 108 per cent longer than regular rayon floor coverings and soils about 35 per cent less.

American Viscose Corp., 1617 Pennsylvania Blvd., Philadelphia 3, Pa.

Do you want more data? Write supplier or use card on page 181; list H-120

Tilting elevator floor cuts handling cost

Existing Otis elevators can now be equipped with a tilting platform to automatically unload caster-equipped materials handling units such as filling trucks, provided the extra car weight does not overload the machine sheave shaft.

When a loaded elevator equipped with a tilting floor arrives at the landing to which it was dispatched, an operating device automatically tips the platform so that the boxes in the car run out into a restricted area in front of the elevator, without an attendant.

Otis Elevator Co., 260 Eleventh Ave., New York 1, N. Y.

Do you want more data? Write or use card on page 181; list H-121

NITRIDED SPINNING AND TWISTER RINGS

REVERSIBLE and NON-REVERSIBLE 8 and 10 mm, curved and straight Webb SPINNING RINGS

REVERSIBLE and PLAIN TWISTER RINGS

NITRIDED Rings with a surface hardness of 67 to 69°C Rockwell have greater resistance to wear . . . and are practically FREE from corrosion.

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Mirror-like Finish

For Longer Life— Fewer Ends down— Increased Spinning & Twisting Production— Improved yarn Quality

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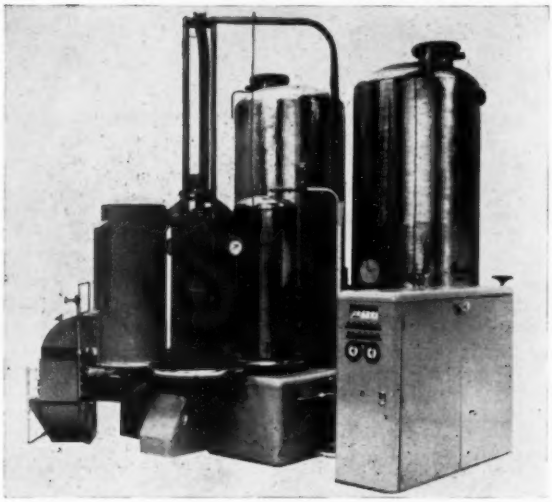
TEXTILE SUPPLIES W D USED MACHINERY

Watson & Desmond

P. O. BOX 1954 • CHARLOTTE, NORTH CAROLINA

Finishes ladies' nylons automatically



The Teintofix 58 preboards, scours, dyes, and finishes ladies' hosiery automatically. Developed by Ets. Maurice Heliot and Ets. Clermont-Bonte, France, the machine utilizes four stations: one for stripping and boarding; two stations for processing; and one station for drying and finishing. Using conventional dyestuffs, scouring agents, finishes, and dulling agents, the unit is effective in producing uniform dyeings regardless of lot size. It is possible to switch it from one color to another in approximately five minutes without dumping water or wasting heat. Production ranges from 200- to 250-dozen pairs per eight hours. Two operators are needed.

It preboards in a separate step, the conventional manner, and dyes and scours in separate operations by circulating the scouring and dye baths over the stockings. Hydraulically operated, it is controlled by a series of switches and timers.

International Textile Machine Co., 403 N. Tryon St., Charlotte, N. C.

Do you want more data? Write ◂ or use card on page 181; list H-122

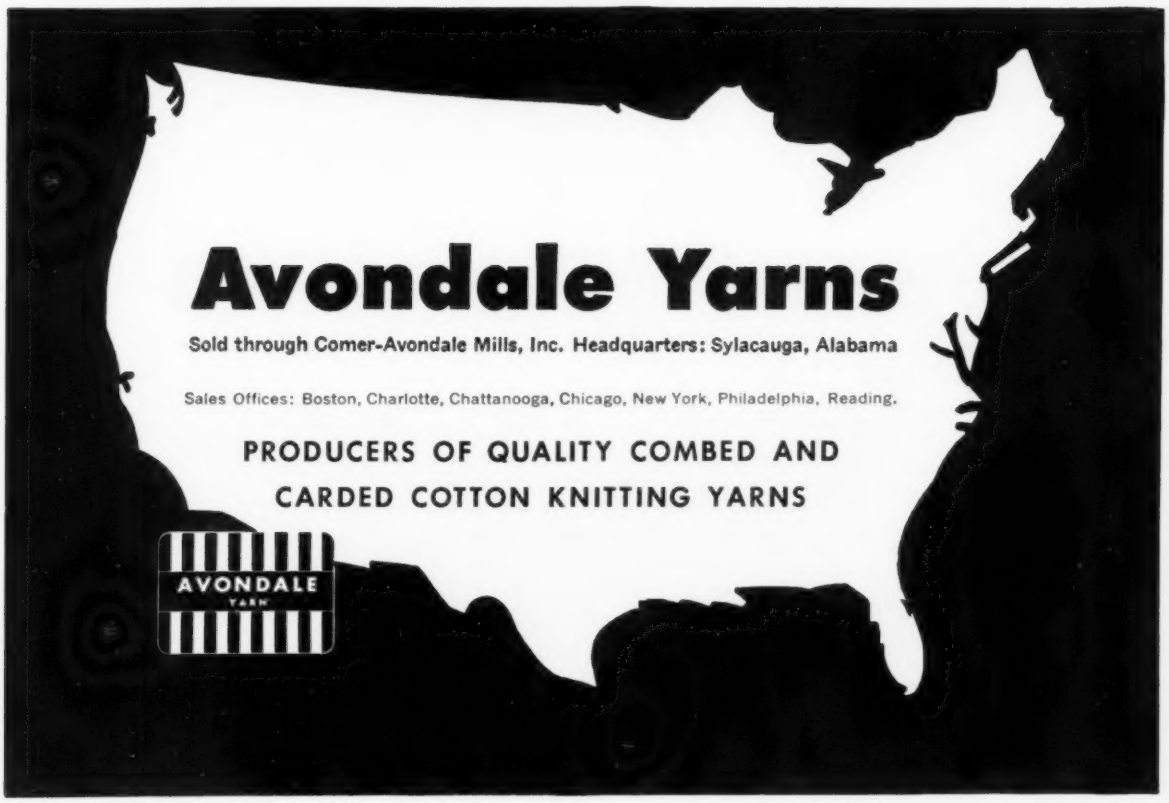
Lab instrument analyzes colors

A color analysis instrument, which permits extremely accurate readings in per cent reflectance of textiles, plastics, dyes, and a variety of other products, consists of a Spectronic "20" spectrophotometer and a reflectance attachment. It provides easy operation, low cost, and does not need glass filters. The design allows convenient examination of various sized samples.

The instrument projects a spot of light which permits accurate color analysis of extremely small samples. In order to handle large size samples with ease, the measuring aperture cover is designed to swing completely out of the way and ample room is provided for operating the shutter.

Bausch & Lomb Optical Co., Rochester, N. Y.

Do you want more data? Write ◂ or use card on page 181; list H-123


Avondale Yarns
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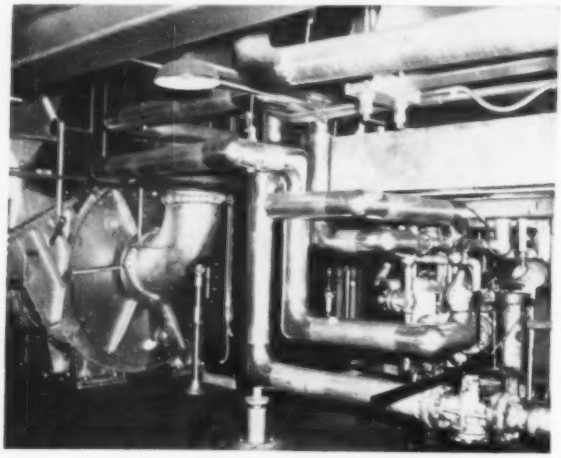
Sales Offices: Boston, Charlotte, Chattanooga, Chicago, New York, Philadelphia, Reading.
PRODUCERS OF QUALITY COMBED AND
CARDED COTTON KNITTING YARNS
AVONDALE
YARN

Equipment briefs

Aluminum jacketing for insulated turns is made in preformed Humped Elbows which are attached in two pieces with aluminum screws. They contain ample space to fit



both sharp or gently curving turns without trimming away insulation. The aluminum elbows are made in 12 sizes to fit 107 combinations of pipe diameters and insulation thicknesses up to an outside diameter of 12.81 inches.

Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.

Do you want more data? Write supplier or use card on page 181; list H-124

Abrasive paper that does not load contains a special coating to prevent clogging. This feature permits the paper to be used much longer in such activities as sanding paints, varnishes, etc.; and a choice of grits in Crystolon, garnet, and Garalum suit the paper for sanding and polishing delicate machine parts. Containing a tough, flexible backing to prevent slipping in the operator's hand, its wearing and fast-cutting properties have effected savings of 33% in some cases. It may be used dry.

Armour and Co., Coated Abrasives Div., Alliance, Ohio.

Do you want more data? Write supplier or use card on page 181; list H-125

A plastic-coated sensing bulb and thermal system for use in corrosive applications is available with the entire thermal bulb and capillary tubing system heavily coated with a heat-conducting plastic film to provide corrosion resistance to a wide variety of chemicals—suited for operation in temperatures up to 185 F.

Jordan Industrial Sales Div. of OPW Corp., 6013 Weihe Rd., Cincinnati 13, Ohio.

Do you want more data? Write supplier or use card on page 181; list H-126

Homogenizing and mixing on a continuous flow basis is performed by the Pipe-Line homo-mixer. The unit can be installed on existing pipe lines or made up with standard I.P.S. fittings for use where a pipe line does not currently exist. For use in preparing resin dispersions, printing pastes, etc., the unit is mounted on a structural steel platform for portability and easy installation. It will combine mixture of liquids, gases, and solids that can flow through piping.

Gifford-Wood Co., Hudson, N. Y.

Do you want more data? Write supplier or use card on page 181; list H-127

20th

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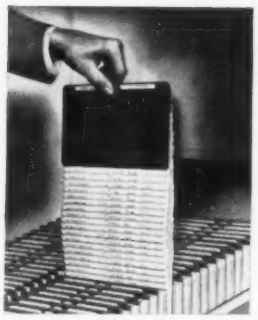

Packs of visible records make any drawer a record file. The packs, called Activisible, are made up of individual cards locked together into one composite sheet with one edge of each card left in sight. It is on these edges that the file system captions are inserted. The packs fold easily to pocket size or lie flat to allow the individual cards to be read, processed, etc.

Acme Visible Records, Inc., Crozet, Va.

Do you want more data? Write supplier or use card on page 181; list H-201

Two wound rotor motors featuring a significant size reduction (up to half the size and weight of previous models) have a minimum breakdown torque of 275 per cent. The motors feature up to 59 per cent size reductions and 49 per cent weight savings. The Tri-Clad 55 wound rotor motors are available from five through 150 hp. Type MR motors, intermittent rated for crane and hoist operation, are available in either totally enclosed non-ventilated or drip-proof enclosures. They are best suited for applications requiring varying speed and high starting or maximum torque. They may be converted from drip-proof to totally enclosed non-ventilated in the field by adding or removing handhole covers and changing pulley and end shields. Type M motors, rated for constant or adjustable speed, are available in open drip-proof enclosures for application on industrial equipment such as pumps, compressors, and fans.

General Electric Co., Schenectady 5, N. Y.

Do you want more data? Write supplier or use card on page 181; list H-128

A static detecting device capable of measuring charges of virtually any magnitude—measurement parameters extend from five volts to infinity—is designed for accurate quantitative measurement of static charges occurring in product or process flows. The Inonstat provides immediate indication of static, simultaneously identifying the charge as positive or negative. Portable, the unit operates on batteries.

U. S. Radium Corp., Morristown, N. J.

Do you want more data? Write supplier or use card on page 181; list H-129

Traveler cups are available for installation on umbrella creels. The units are attached to upright creel members with steel straps.

Saco-Lowell Shops, 60 Batterymarch St., Boston 10, Mass.

Do you want more data? Write supplier or use card on page 181; list H-130

A 2000-pound capacity hand lift truck has been added to a companion line of redesigned 3000-, 4000-, and 6000-pound trucks. The Load-Lift trucks are made in a complete range of sizes and include types for handling both pallets and skids.

The American Pulley Co., 4200 Wissahickon Ave., Philadelphia 29, Pa.

Do you want more data? Write supplier or use card on page 181; list H-131

An extreme pressure lubricant packaged in a self-contained polyethylene oil can is a solvent-refined petroleum

LOCKWOOD GREENE PROJECTS IN...

SYNTHETIC FIBERS

In designing and supervising the construction of many synthetic fiber plants, Lockwood Greene has gained recognition in the specialized engineering problems involved in this field.

Allied Chemical & Dye Corporation, National Aniline Division, Hopewell, Virginia.

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oil containing a stable dispersion of molybdenum disulfide. Molylube 110-L imparts a tough film capable of withstanding shock loads and wiping action. With additives that impart effective rust preventive qualities, and displaying high lubricity and polar affinity for metal surfaces, the oil has a high viscosity index to assist in the lubrication of bearing and machine parts at high temperature—recommended for high-speed spindles, tightly fitted bearings, heavily loaded bearings, etc.

Bel-Ray Co., Inc., Green Village Rd., Madison, N. H.

Do you want more data? Write supplier or use card on page 181; list H-132

Electronic air cleaners—Series 300—with a 90% efficiency rating are made for use in smaller commercial and industrial buildings equipped with forced-air heating, ventilating, or cooling systems. Representing 15 models with 10 capacities ranging from 800 to 9600 cfm, the units are compact, easily installed, and virtually maintenance free.

Electro-air Cleaner Co., Inc., Olivia and Sproul Sts., McKees Rocks, Pa.

Do you want more data? Write supplier or use card on page 181; list H-133

Welded steel pulleys featuring Taper-Lock hubs offer maximum strength combined with economy of weight and give the equivalent of a shrunk fit on the shafting. Assembly and disassembly are easily done.

Continental Gin Co., Industrial Div., Birmingham 2, Ala.

Do you want more data? Write supplier or use card on page 181; list H-134

An office copying machine that can reproduce anything from a business card to a 10" x 16" form is equipped with an automatic timer which compensates for changes in electrical voltage. Called the Verifax Viscount Copier, it has an improved paper feed assembly and a new trimmer guide assembly for 10" paper. Up to five copies of any typed, written, drawn, or printed original may be made on it at a materials cost of about 2½ cents per copy. Capable of making intermediates or masters for use in diazo-type printers, the copier is also adaptable for use with the Verifax method of producing offset masters for office-type duplicators.

Eastman Kodak Co., Business Photo Methods, Rochester 4, N. Y.

Do you want more data? Write supplier or use card on page 181; list H-135

A highly versatile transistorized amplifier relay system for remote control of temperatures in industrial applications consists of a compact amplifier which serves as the temperature controller, and a vibration-proof mounting containing a thermistor which acts as the sensing element. Mountings for the thermistors are available in a wide variety of sizes and shapes to fit any application. Amplifier relays are available in eight overlapping ranges of approximately 100 F to permit control from minus 60 F to plus 520 F.

Minneapolis-Honeywell, Control Device Div., 2747 Fourth Ave., S., Minneapolis, Minn.

Do you want more data? Write supplier or use card on page 181; list H-136

A system that provides multiple visible records consists of individual pages locked together in a manner which permits one, two, or more lines of each page to re-

main in sight. Called Multiliner, the system, though firmly locked, is easily changed. Individual records are flexed out and the new one inserted regardless of position in the sheet. When locked, the individual forms make up one composite sheet which can be inserted in a typewriter or laid flat for photographic reproduction.

Acme Visible Records, Inc., Crozet, Va.

Do you want more data? Write supplier or use card on page 181; list H-137

A geared flexible coupling for shaft diameters up to 1⅞" is especially designed for use as a motor coupling—for transmitting electric motor power to pumps, generators, speed reducers, etc. Called the type MC, its basic principles of operation are like those of a conventional geared coupling, i.e., externally geared hubs are mounted on the shafts and joined flexibly by an internally geared sleeve. Power transmitting parts are steel. The coupling sleeve is of one-piece design, and the coupling is enclosed in a two-piece metal cover sealed to prevent lubricant loss or contaminant entry.

Link-Belt Co., Dept. PR, Prudential Plaza, Chicago, Ill.

Do you want more data? Write supplier or use card on page 181; list H-138

Fittings and pipe lined with unplasticized polyvinyl chloride (UPVC) are furnished in sizes from ½" through 3" for use in handling corrosive liquids. Pipes are of steel, normally: joints of cast iron. The lining has high corrosion resistance, non-flammability, non-toxicity and non-aging properties, no electrolytic action, and smooth interior walls. The piping systems can satisfactorily handle temperatures up to 190 F and pressure up to 500 psi. The system of pipes and fittings, called Swepcore, is supplied with plain pipe ends. Flared joints are used.

Tube Turns Plastics, Inc., 2929 Magazine St., Louisville, Ky.

Do you want more data? Write supplier or use card on page 181; list H-139

A face seal and bearing support that is designed to provide installation and maintenance savings for immersed rolls, rotors, and shafts is particularly suited for applications under conditions found in the textile and similar process industries. The stem acts as effective and relatively frictionless seal against leakage, yet its design permits external mounting of shaft bearings. It eliminates scoring and damage to costly shafts. All wearing parts are easily replaced, and the bracket and bearing, without the seal, are suitable as an external mounting for dryer roll applications.

Rodney-Hunt Machine Co., Orange, Mass.

Do you want more data? Write supplier or use card on page 181; list H-140

A wrapper imprinting attachment for wrapping, bundling, pouch, and bag-making machines is exceptionally compact and light in weight. The unit can be readily attached to a packaging machine in vertical or horizontal (even upside down) positions. The Wrap-A-Print attachment uses roll leaf instead of inks, which assures sharp and rub-proof imprints and eliminates ink drying problems on wax paper, polyethylene, cellophane, coated foil and similar materials in high-speed production operations. The roll leaf is available in black, white, yellow, red, blue, green, and other colors.

Adolph Gottscho, Inc., Hillside 5, N. J.

Do you want more data? Write supplier or use card on page 181; list H-141

FREE 30-DAY TRIAL!

Try this new, powerful, low cost textile magnet in your own lines—no obligation

Big, 36" spiked apron magnet costs only $224

Available direct from Eriez, or through your original equipment manufacturer

Pardon our enthusiasm—but we're so sure our new spiked apron magnet, designed especially for use where light flows of material are involved, is the *greatest* thing the textile industry's seen for years, we're willing to let you try it for a 30-day test period. *No* high pressure sales talk; *no* cajolery; *no* obligation of any kind. If you're not satisfied at the end of the trial period (but we know you will be) just return the unit—no questions asked. Have you ever had a *better* offer?

For years, Eriez textile magnets have been the overwhelming favorite of the industry; in fact, *nine out of ten mills specify "ERIEZ" when they order.* These non-electric magnetic units remove all traces of tramp iron from fiber and waste lines; protect carding and garneting equipment; prevent fires, product contamination and machinery damage. No other magnetic equipment manufacturer has the experience, the know-how or the skilled field and lab staffs that Eriez has—and there's always an Eriez sales engineer nearby to serve you. Why take a chance? . . . take Eriez and *know* you're getting the most dependable, most economical tramp iron protection.

Note these features: Completely non-electric units; no operating or maintenance costs; first cost is the only cost. Magnetic strength is guaranteed forever. Units are self-contained; quickly and easily installed.

Cut out this coupon; mail it today!

Eriez Mfg. Co.,
72-H Magnet Drive, Erie, Pa.

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( ) Please mail more information on the Model D magnet
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City_____ State_____

ERIEZ

New dyes and chemicals

A black dyestuff for wool, called Naphthol Blue Black B Conc. Purified, provides an acetate reserve equal to that of premium-priced blacks for wool, and is equal in all other properties to Naphthol Blue Black B Conc.

Sandoz, Inc., 61-63 Van Dam St., New York 13, N. Y.

Do you want more data? Write supplier or use card on page 181; list H-142

A silicone emulsion designed specifically for softening thermosetting textile finishes offers high tear strength, abrasion resistance, and enhancement of sewing properties. Called XLE-48, it stands up well under repeated washings and dry cleanings, resists yellowing, water spotting, and chlorine damage, is nongassing and is compatible with other finishing materials. Other suggested uses are: nonwoven fabric softening, yarn lubrication, and latex release and warp sizing.

Union Carbide Corp., Silicones Div., 30 East 42nd St., New York 17, N. Y.

Do you want more data? Write supplier or use card on page 181; list H-143

Mildew protection for rayon yarns and fibers is offered by Mildant RX, a highly concentrated water-soluble product. It may be applied to yarns from emulsion troughs of cone winders, from wet twisters, or from spray-type conditioning chambers, etc. When used on material already supporting mildew growth, it stops further damage.

Laurel Soap Mfg. Co., Inc., Tioga, Thompson, and Almond Sts., Philadelphia 34, Pa.

Do you want more data? Write supplier or use card on page 181; list H-144

An antifoam, penetrant, and dispersing agent in wet processing operations is called Hodag PX-1 and is a replacement for pine oil in most formulations where "preservative" properties are not required. It is suitable for use as an antifoam, leveling agent, and solvent in a broad range of applications.

Hodag Chemical Corp., 7247 N. Central Park, Chicago 45, Ill.

Do you want more data? Write supplier or use card on page 181; list H-145

A green vat dyestuff that produces a full yellowish green shade is recommended for shirtings, raincoat material, and colored woven goods. Called Cibanone Green 6G Paste, it is stable to chlorine, has excellent light and all-around fastness properties, is suitable for vulcanization, and can be applied as a pigment and in continuous dyeing operations.

Ciba Co., Inc., 627 Greenwich St., New York 14, N. Y.

Do you want more data? Write supplier or use card on page 181; list H-146

Nine wool dyes representing red, browns, blue, black, yellows, and orange colors give very good light and wet fastness. Called Calcofast Neutral Dyes, they work with less acid and dye more quickly and with more evenness than older classes of metalized dyes. Useful for dyeing wool stock, slubbing, tops, yarn and cloth, for dyeing nylon staple, tow, tops, yarn and cloth, for dyeing silk noils, yarn and cloth, and for dyeing blends, the dyes are easy to handle.

American Cyanamid Co., Dyes Dept., Bound Brook, N. J.

Do you want more data? Write supplier or use card on page 181; list H-147

AMERICA'S SPRING STEEL DISTRIBUTOR

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Modern Slitting and Shearing Equipment

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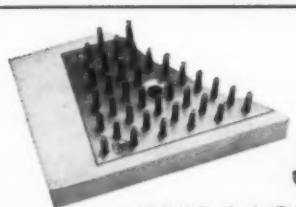

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FALL RIVER, MASS. Dial OSborne 6-8261

Four catalysts are available for promoting the cure acceleration of thermosetting resins. Known as the Curites, the compounds are based on metal salts and organic compounds, are water-white liquids, and do not discolor during high-temperature curing.

Proctor Chemical Co., Salisbury, N. C.

Do you want more data? Write supplier or use card on page 181; list H-148

A cationic softener adds a soft, lubricated, and pliable hand to cotton and synthetic fibers and does not yellow when exposed to atmospheric oxides of nitrogen. Marketed as Avitex Q fabric softener, it is suitable for use as a self finish and in conjunction with starches and various resin finishes. Used with Zeset, it provides fabric finishes with improved tear strength and sewability. It is an effective plasticizer for thermoplastic resins which are used to obtain finishes semi-durable to laundering.

E. I. du Pont de Nemours & Co., Inc., Dyes & Chemicals Div., Wilmington 98, Del.

Do you want more data? Write supplier or use card on page 181; list H-149

The finishing agent Resloom HP is a methylol melamine resin especially designed for use in textile finishing to provide: improved wrinkle recovery and dimensional stability on cellulosic fabrics or blends containing such fibers; permanent texturized effects such as embossing or schreinering on cotton fabrics; and stabilization of all-wool or wool-blended fabrics. Applied by conventional resin application techniques, the resin in a water solution is padded on the fabric and dried and cured.

Monsanto Chemical Co., Plastics Div., Box 1531, Springfield 2, Mass.

Do you want more data? Write supplier or use card on page 181; list H-150

For use on nylon and wool is a bright green dye, designated "Capracyl" Green 2Y, which is particularly recommended for materials to be used as suitings, carpeting, or upholstery fabrics. Possessing good light fastness and wet processing properties, the new product dyes nylon or wool levelly, builds up on tone from pastel to full green shades, and can be applied in all types of conventional equipment to rawstock, yarn or fabric of filament nylon, spun nylon, or wool. It becomes yellower in shade under incandescent light.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Do you want more data? Write supplier or use card on page 181; list H-151

A blue dyestuff for cotton and viscose rayon, called Diphenyl Fast Navy Blue ARL, is superior in light and wash fastness. On spun rayon the light fastness is actually improved by crease-proof finishing. Yielding rich, bloomy shades of navy with three per cent on cotton, viscose, and spun rayon, the dyestuff has excellent dischargeability, good acetate reserve, and is level dyeing.

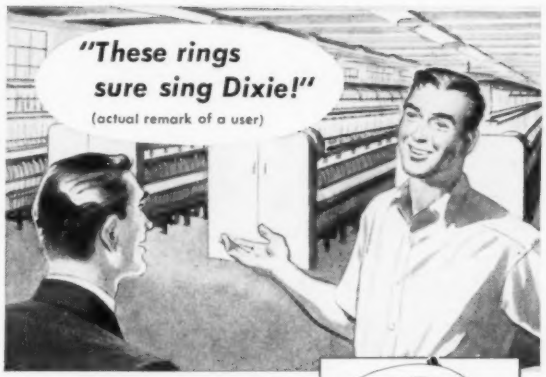
Geigy Dyestuffs, div. of Geigy Chemical Corp., Ardsley, N. Y.

Do you want more data? Write supplier or use card on page 181; list H-152

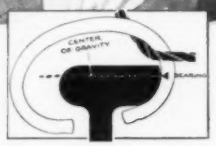
The improved polyacrylamide-type flocculant known as Separan NP10 is a refinement of Separan 2610. Operational characteristics remain unchanged in the compound that is made for chemical processing, water treatment, and such other industrial applications. In water treatment it improves the clarity of treated water, increases the settling rate of precipitated and suspended solids, and decreases treatment costs. It is also used in waste and sewage treatment to decrease stream pollution and to recover valuable materials.

The Dow Chemical Co., Midland, Mich.

Do you want more data? Write supplier or use card on page 181; list H-153



ANTI-WEDGE* Spinning Rings



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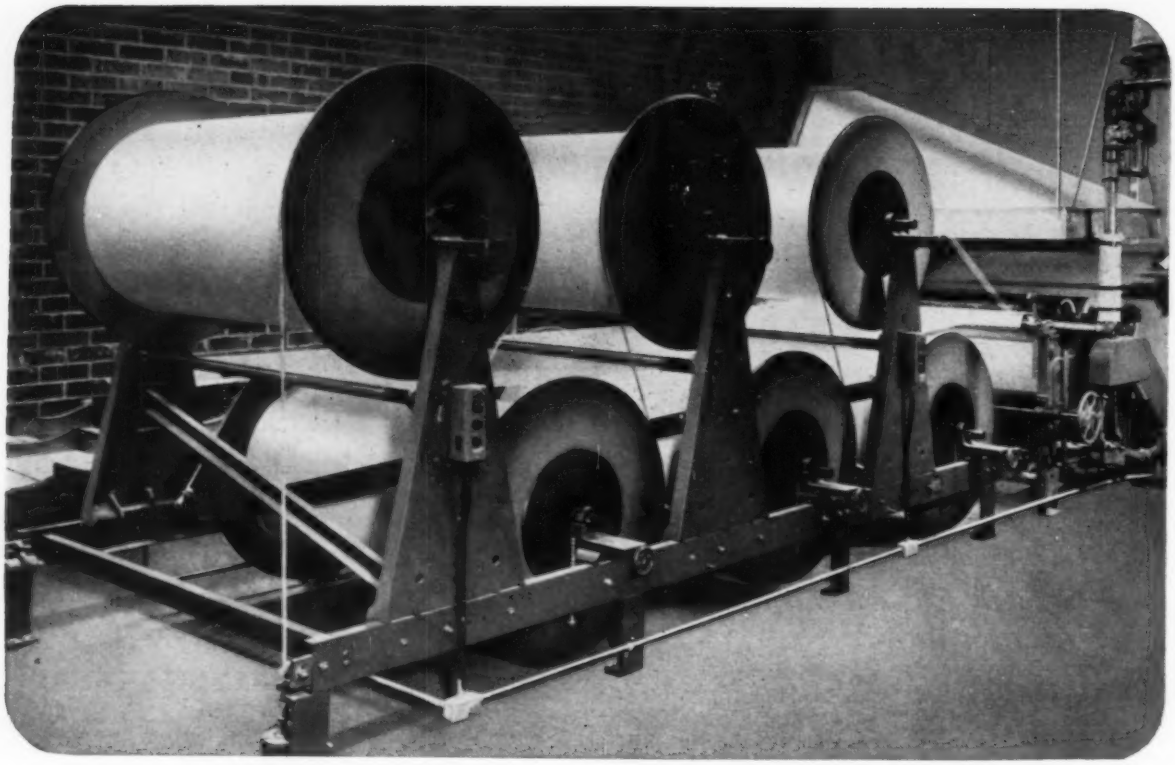

West Point Foundry Development Answers Needs of Many Mills

New Equi-Tension Creel Improves Warp Quality With Reduced Waste

WEST POINT, GA. — The Equi-Tension Slasher Creel was developed by the West Point Foundry and Machine Company in answer to requests for a creel which would permit more even run-outs on the section beams.

Previously on conventional over-under slasher creels the warp on the back beams (those beams farthest from the size box) has been stretched more than the warp on the beams closest to the size box. This has resulted in warp being left over or wasted when a set runs out.

Mills using West Point's Equi-Tension Creel report reductions of creel waste as high as 50% and 75%. Users have also noted the elimination of slack ends, the reduction of selvages rolling, the easier running of section beams containing a small number of ends, and smoother operation with wet dye beams.

Here is a brief explanation of the operation of the Equi-Tension Creel. First, the top beam stands are made high enough to draw the warp from each beam between the upper and lower tiers. Each beam is weighted identically, without the usual variations found on the conventional over-under creel. Run-out is more even—front and back beams empty together without a large amount of warp being left over on the back section beams. Thus pounds of warp ordinarily wasted can be run through.

Second, guide rolls prevent warp from passing between the heads of section beams ahead. Broken or rolled selvages caused by the warp ends rubbing against the inner sides of beam heads are thereby eliminated. The guide rolls also make exact alignment of the section beams less important than the over-under creel. Creeling time is further reduced by a locking creel bearing which cuts alignment time in half. The locking creel bearing was developed by the research division of West Point Manufacturing Company, and is optional equipment available at additional cost.

Rigidity is also considered of primary importance in a creel to prevent any misalignment and unsteadiness, just as it is in the slasher head end, drying section, and size box. To be certain of that rigidity the West Point Foundry and Machine Company makes the Equi-Tension Creel stands from machined cast iron, just as it does the frames of the slasher head end, any cylinder drying section, and the size box. The cast iron creel stands are machined for accurate alignment where fitted to the continuous channels running the length of the creel, and the X-shaped cross girts are also secured against machined pads.

The Equi-Tension Creel is available in a number of different heights and horizontal spacings according to the diameter of the section beams and the clearance desired between the section beams. The Equi-Tension Creel is made in both stationary form and as a magazine creel with roller bearing wheels permitting forward-and-backward movement or side-to-side movement on steel tracks. It is in use behind both West Point Foundry Multi-Cylinder Slashers and West Point Foundry Air-Dri Slashers, but is equally applicable to old and new slashers alike, since its primary advantage is the saving of waste by reducing uneven run-outs.

For more information concerning the Equi-Tension Creel, write or telephone West Point Foundry and Machine Company, West Point, Ga.

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8-3 INSPECTION AND CONTROL EQUIPMENT. Series of bulletins covers the use, installation and maintenance of electronic inspection and control equipment for the textile industry. Lindly & Co., Inc., 248 Herricks Rd., Mineola, L. I., New York.

8-4 TEXTILE CHEMICALS. Booklet describes over fifty products and contains cross index according to use. Includes coning oils, detergents, dyeing assistants, fiber lubricants, warp sizes, water repellents, wetting agents, etc. Nopco Chemical Co., Harrison, N. J.

8-5 GUIDE TO BETTER CLOSURES. For use as a guide for the evaluation of methods currently in use to effect economics and better production in the closure of fiber board boxes. Acme Steel Products Div., Acme Steel Co., 135th and Perry Ave., Chicago, Illinois.

8-6 SPLICING YARNS AND TAPES. Booklet describes how new Vulcanol Adhesive AL-1005 preforms instant splicing of nylon, acetate, acrilan, viscose, cotton and woolen yarns. Alco Oil & Chemical Corp., Trenton Ave. & William St., Philadelphia 34, Pa.

8-7 STATIC POWER DRIVE. Publication describes Ultraflex M Magnetic Amplifier Packaged Drive, a compact, simple drive which utilizes a static source of power. Cutler-Hammer, Inc., 226 East Juneau, Milwaukee 1, Wis.

8-8 NEW AIR CONDITIONERS. Bulletin describes new line of AAF-Herman Nelson Air Conditioning Units, featuring the Roll-O-Vent automatic air filter. American Air Filter Co., Inc., Louisville 8, Ky.

8-9 TEXTILE PACKAGING. Brochure describes capabilities to convert paper, foil and plastic film to literally countless products, packages, and bag-type containers for textiles. Kennedy Car Liner and Bag Co., Inc. Dept. 7, Shelbyville, Indiana.

8-10 PRESSURE SENSITIVE TAPES. Brochure tells of applications in yarn spinning, weaving, finishing, rug manufacturing, etc., Minnesota Mining & Mfg. Co., St. Paul 6, Minn.

8-11 TEXTILE PACKAGING. Brochure describes capabilities to convert paper, foil and plastic film to literally countless products, packages, and bag-type containers for textiles. Kennedy Car Liner and Bag Co., Inc., Dept. 7, Shelbyville, Indiana.

8-12 AIR LINE ACCESSORIES. Catalog describes complete line of filters, regulators, drain traps, lubricator to achieve clean, regulated, lubricated air. Hanna Engineering Works, 1765 N. Elston Ave., Chicago 22, Ill.

8-13 CARD FLAT CHAIN, Bulletin describes quality, rust proof, long life, individually packaged card flat hain. Ramsey Southeast Corp., 521 Dowd Rd., Charlotte, N. C.

8-14 BUTADIENE-STYRENE LATEX. Data sheet describes carpet backing with high tensile strength, exceptional loading capacity, high stiffness, excellent color, heat and light resistance. Firestone Synthetic Rubber & Latex Co., Akron 1, Ohio.

8-15 AUTOMATIC STOP MOTION. Complete information available on automatic stop motion for TITAN warp tying-in machine. Edda International Corp., 469 Fourth Ave., New York 16, N. Y.

8-16 CHECK VALVES. Brochure describes complete line of bronze and iron body check valves, showing the difference between two basic types. The Fairbanks Co., 393 Lafayette St., New York 3, New York.

8-17 SYNTHETIC BLENDER. Information on blending machine that assures delivery of synthetic fibers to pickers, webbers, etc., in such shape that these machines can do their work properly. Cen-Tennial Cotton Gin Co., Columbus, Ga.

8-18 FIBER STRESS — STRAIN PROPERTIES. 36-Page technical information bulletin on properties of acetate, Dacron, polyester fiber, Orlon acrylic fiber, nylon, rayon cotton, silk and wool. Tells how this knowledge can help mill men, and designers. Bulletin 92, E. I. du Pont de Nemours & Co., Inc., Textile Fibers Dept., Wilmington 98, Delaware.

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OPENING THROUGH ROVING

R-1 Lummus Pepper-Shaker Opener —Gives complete details and photographs Aldrich Machine Works, P. O. Box 750, Atlanta, Ga.

R-2 Static Elimination — How to eliminate static safely and inexpensively. Simco Co., 920 Walnut St., Lansdale, Pa.

R-3 Card Grinding Information — Care and operation of cards. B. S. Roy & Son Co., Worcester, Mass.

R-4 Card Clothing — Describes Strip-O-Matic Card Clothing. Benjamin Booth Co., Allegheny Ave. & Janney St., Philadelphia, Pa.

R-5 Versa-Matic Drawing Frame — Describes drafting elements, quality of sliver, roving and yarn possible. Saco-Lowell Shops, 60 Batterymarch St., Boston, Mass.

R-6 Sargent Opener—Describes opener with rotary evener and stripper. C. G. Sargent's Sons Corp., Graniteville, Mass.

R-7 Ball Bearing Comb Boxes — Describes working principle, shows cut-away Views, Southern States Equipment Corp., Hampton, Georgia.

R-8 Feathertouch Drafting — Describes "highest production per frame at lowest cost." Ideal Industries, Inc., Bessemer City, N. C.

R-9 Automatic Weighing Feeders — Tandem Weighing Feeder produces webs, mats and felts of continuing accuracy. W. D. Dodenhoff Co., Inc., Box 178, Greenville, S. C.

R-11 Flexidyne Individual Card Drive—Describes operating principles, includes prices. Dodge Mfg. Co., Mishawaka, Indiana.

R-12 Bobbins — Catalog describes metal, wood and plastic bobbins. Illustrations show actual use. Lestershire Spool Div., National Vulcanized Fiber Co., Johnson City, N. Y.

R-13 Tips On Carding Procedure — Very helpful monthly bulletin concerns card operation and care. Ashworth Brothers, Fall River, Mass.

R-14 Pneumastop For Fly Frames—Brochure shows type of installation and method of operation. Pneumafil Corp., Charlotte 8, N. C.

R-15 Advantages of Aldrich Pickers —Good technical text, comprehensive pictures. Aldrich Machine Works, P. O. Box 750, Atlanta, Ga.

R-16 Universal Card Coiler—Gives 12 reasons why it's "the best," includes dimensions. McDonough Power Equipment, Inc., McDonough, Ga.

R-17 New Condenser Tape — Describes Supr-O-Tape an impregnated fabric condenser tape. Benjamin Booth Co., Allegheny Ave. & Janney St., Philadelphia 34, Pa.

R-18 Coilers and Conversions — Describes new complete coilers and conversions for cards. Southern States Equipment Corp., Hampton, Ga.

R-19 84" Woolen Card — Includes picture, floor plan, description, and technical details. Davis & Furber Machine Co., North Andover, Mass.

R-20 SRRL Opener—Cleaner—Information on new SRRL development for opening and cleaning cotton being manufactured for sale to mills by Davidson-Kennedy Co., 1090 Jefferson St., N. W., Atlanta, Ga.

SPINNING—TWISTING—WINDING—SPOOLING—WARPING—THROWING

R-101 Spinning News — Up-to-the minute news on spinning equipment. Roberts Co., Sanford, N. C.

R-103 Products For Spinning and Weaving—Complete line, applications, advantages shown. Dayton Rubber Co., Textile Div., Dayton, Ohio.

R-104 New Bobbin Manual — Only complete, authoritative bobbin guide in the industry. Write direct to Dept. DD, Lestershire Spool Division. National Vulcanized Fibre Co., Wilmington 99, Delaware.

R-105 Spindle Oil — "Gulfspin" insures against excessive wear and eliminates spindle wobble. Gulf Oil Corp., Gulf Bldg., Pittsburgh, Pa.

R-106 ANTI-STATIC AGENT. Data sheet lists basic characteristics of liquid anti-static agent which eliminates processing difficulties with fibers due to static electricity. E. F. Houghton, 303 West Lehigh Ave., Philadelphia 33, Pa.

R-108 High Speed Automatic Quiller —Lists advantages and dimensions of "Autocopser." Terrell Machine Co., Inc., P. O. Box 928, Charlotte, N. C.

R-110 Stop Frame On Roving Failure—Adamstop instantly detects roving failures, stops frame. Adams, Inc., 209 East Stone Ave., Greenville, S. C.

R-111 Automatic Cop Winder—Tells how high production with less labor is possible. F. A. Lazenby Co. 3106 Elm Ave., Baltimore 11, Md.

R-112 Bahnson Packaged Modernization—Details on Collecto-Vac, Open-Aire Creels, Cross-Jet Cleaner, Air Conditioning. Bahnson Company, Winston-Salem, N. C.

R-113 Sectional Warper — Describes full width and sectional warpers for knitting, weaving. Robert Reiner, Inc., Weehawken, New Jersey.

R-114 Conical Rings and Flyers — Complete details and specifications. Herr Manufacturing Co., Inc., 318 Franklin St., Buffalo 2, New York.

R-115 Precise Winding Machine — For winding pineapple or straight cones and tubes of synthetics. Foster Machine Co., Westfield, Mass.

R-116 Automatic Cleaning Equipment—Working details and advantages of the Tri-Rail Cleaner. American Monorail Co., 13107 Athens Ave., Cleveland 7, Ohio.

R-117 Aluminum Section Beams — Lists advantages, includes prices and delivery schedules. Hayes Industries, Inc., Jackson, Mich.

R-118 Lubricants For Textiles — Samples of Ben Boy Bearing, Spindle, Twister Lubricants and Non-Melting Oils. Georgia-Carolina Oil Co., Box 101, Macon, Ga.

R-119 Custom Made Thread Guides—Includes composition, properties, specifications of all designs. American Lava Corporation Chattanooga 5, Tenn.

R-120 Spinning Frame Conversions—Big-package, new-frame results at half the cost. Meadows Mfg. Co., Station A., Atlanta, Ga.

R-121 Collecto-Vac — New development collects lint, fly and broken ends. The Bahnson Company, Winston-Salem, N. C.

R-122 Static Eliminator For Warpers-Slashers-Creels—Increased production, improved quality, reduced waste. The Portland Co., 22 Fore St., Portland, Maine.

R-123 Spinning and Twister Rings — Complete details, pictures, price lists. Whitinsville Spinning Ring Co., Whitinsville, Mass.

R-125 Lint-Free Creel—Complete details and pictures of the new Airfoil Design. Pneumafil Corporation, Charlotte 8, N. C.

R-126 Gear Bulletins — Cover products and gears for the complete textile mill. Precision Gear & Machine Co., 2001 N. Tryon St., Charlotte 2, N. C.

R-128 Suction Cleaning System—Details on new Collector Unit Model C-4. Pneumafil Corp., Charlotte 8, N. C.

R-129 Facts About Your Flyers and Spindles—Advantages of smooth flyer and spindle operation. Ideal Machine Shops Bessemer City, N. C.

R-132 Traveling Cleaners—Describes improved frame and room cleaners. Parks-Cramer Co., Fitchburg, Mass.

R-133 Lapless Endless Spinner—Full information available. Ton Tex Corporation, 31 Columbus Ave., Englewood, N. J.

(Continued Next Page)

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R-135 Worsted Spinning — Describes five stages from top to yarn. Saco-Lowell Shops, 60 Batterymarch St., Boston 10, Mass.

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R-141 Handy Spinning Reference — Shows traveler speeds, sizes of ring flanges. Victor Ring Traveler Co., Providence, R. I. and Gastonia, N. C.

R-142 Unirail Uptwister — Higher yarn quality and better packages at faster speeds. Universal Winding Co., P. O. Box 1605, Providence, R. I.

R-144 Precision Textile Winding — Tensions and Density Control for winding rubber cones. Kidde Mfg. Co., 35 Farrand St., Bloomfield, N. J.

R-145 Roller Bearing Spindles — Pictured in cut-away views, advantages described. The Marquette Metal Products Co., 1145 Glenwood Ave., Cleveland, Ohio.

R-146 Cone Winder—Describes Model 102 winder, including applications. Foster Machine Co., Westfield, Mass.

R-147 Short Cut To Staple Fiber Spinning—Ten steps in operation of the Tow Stapler. Turbo Machine Co., Lansdale, Pa.

R-148 Weaver's Knotter — Instructions as to use, description. A. B. Carter, Inc., Gastonia, N. C.

R-149 Textile Roll Coverings — Describes complete line as well as other mill supplies. Armstrong Cork Co., Industrial Div., Lancaster, Pa.

R-150 Lint-Free Motor — Describes motor for constant speed a-c driven pickers, roving frames, spinning and twisting frames, etc. Westinghouse Electric Corp., P. O. Box 2278, Pittsburgh 30, Pa.

R-151 Tape For Driving Spindles — Describes banding for spindle drives on twisting, roving and spinning. Benjamin Booth Co., Allegheny Ave. & Janney St., Philadelphia 34, Pa.

R-152 Giant Aluminum Cotton Beams —Describes 38 x 54" section beams for cotton. Hayes Industries, Inc., Jackson, Mich.

R-153 Woolen Spinning Frame — Colored picture, complete details Davis & Furber Machine Co., North Andover, Mass.

R-154 Large Package Twister—Information on new anti-friction Jumbo Twister which carries a 14" bobbin with a 12" build. Meadows Mfg. Co., P. O. Box 4354, Atlanta, Ga.

R-155 Wide Setover Pin Drafter — Booklet describes advantages, technical aspects, adaptments of wide setover Pin Drafter. Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.

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R-201 Looms — Describes "World's Largest Line of Looms." Crompton & Knowles Loom Works, Worcester 1 Mass.

R-202 Counting And Measuring Devices—Wide range of counting devices for all types of textile machinery Veeder-Root, Inc., Hartford, Conn.

R-203 Loom Supplies — Describes complete line. E. H. Jacobs Northern Division, The Bullard Clark Co., Danielson, Conn.

R-204 Innovation In Textile Drying—Details on Steam or Gas "Hot Air" Slasher. J. O. Ross Engineering Corp., 444 Madison Ave., New York 22, New York.

R-206 Loom Production Charts — Celluloid card shows yards per loom per week. Ralph E. Loper Co., Greenville, S. C.

R-207 Aluminum Beams—Describes lightweight beams for textiles, Hayes Industries, Inc., Jackson, Mich.

R-208 The Story Of Starches — History and information on manufacture and use of starches. National Starch Products, Inc., 750 Third Ave., New York 17, N. Y.

R-209 Loading System — Pneumatic loading system for Saco-Lowell slasher. The Foxboro Company, Foxboro, Mass.

R-211 Steel Warp Beams—Beams for both broadloom and narrow fabrics. Milton Machine Works, Inc., Milton, Pa.

R-212 Penford Gums In Textiles — Describes excellent properties for warp sizing spun yarns. Penick & Ford Ltd., Inc., 420 Lexington Ave., New York 17, New York.

R-213 Saco-Lowell Positrol Slasher—Includes advantages, photographs, cutaway drawings. Saco-Lowell Shops, 60 Batterymarch St., Boston 10, Mass.

R-214 Rotary Unions—Cut costs, get better sealing on can dryers. Perfecting Service Company, 332 Atando Ave., Charlotte, N. C.

R-216 Air Slasher Dryer — Shows construction and operating details. Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia 20, Pa.

R-217 Butt-Tacking Sewing Machine —Describes operation, installation of single thread butt-tacking sewing machine. The Merrow Machine Co., 28 Laurel St., Hartford, Conn.

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R-220 Chemical Data Sheets—Available on a full range of chemicals. Nopco Chemical Co., Harrison, N. J.

R-223 Tufting Machines — Describes automatic pattern attachment. Cobble Bros. Machinery Co., Inc., River Road, Chattanooga, Tenn.

R-226 Prevent Fabric Distortion — How to eliminate distortion and where to check for it. Mount Hope Machinery Co., 15 Fifth St., Taunton, Mass.

R-227 Formulas For Slashing Arnel —Includes also information on warping, weaving and quilling. Textile Sales Dept., Celanese Corp. of America, P. O. Box 1414, Charlotte 1, N. C.

R-228 The Random Web Process — Describes the Rando-Webber and Rando-Feeder. Bulletin 105. Curlator Corp., Textile Div., 501 W. Commercial St., Rochester, N. Y.

R-230 ECLIPSE STARCHES FOR TEXTILES. Data sheet describes use of thin-boiling starches in the textile industry, with particular emphasis on warp sizing. Physical and chemical data included. A. E. Staley Mfg. Co., Decatur, Ill.

R-232 Hydraulic Slasher Drives — Bulletin 5571 describes economical approach to improved slasher operation. Vickers, Inc., 1036 Peachtree St., Atlanta, Ga.

R-233 Textile Accessories — Gives specifications of Gates textile accessories in handy pocket booklet. The Gates Rubber Co., 1001 Broadway, Denver 17, Colorado.

R-234 Cocker Slashers — Complete specifications and advantages, including allied equipment. Cocker Machine & Foundry Co., Gastonia, N. C.

R-235 Mounts For Looms — Vinyl mount eliminates need for bolts or paste. Clark, Cutler, McDermott Co., 106 W. Central St., Franklin, Mass.

R-236 Unifil Loom Winder — Describes new concept of filling preparation which needs no quilling area. Universal Winding Co., P. O. Box 1605, Providence, R. I.

R-237 High Speed Warp Sizer—Gives outstanding features and specifications. Cocker Machine & Foundry Co., Gastonia, N. C.

R-238 Traveling Loom Cleaner—Advantages of the new Oscillaire loom cleaner. Parks-Cramer Co., Fitchburg, Mass.

(Continued Next Page)

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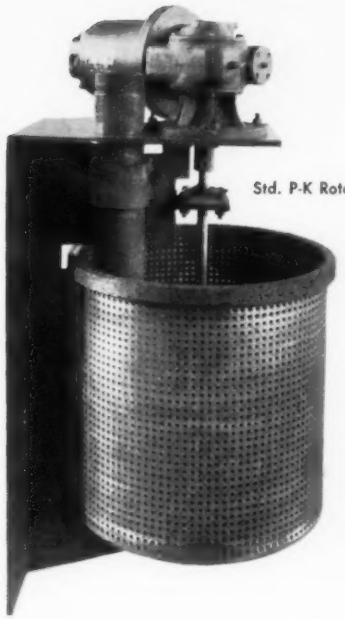

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The obvious way to avoid tube stoppage in a closed-type heat reclaimer is not to let lint or soap curds enter the tubes. And that's exactly what a P-K Roto-Screen does for P-K Heat Reclaimers.

A perforated cylindrical basket, installed in the sump pit, revolves at a speed sufficient to keep its outer surface clean of accumulations of lint and waste. In addition, to offset pump suction or surge, the surface is scraped clean at each revolution by a fixed stainless steel knife. The pump suction line is inside the basket and supplies only screened waste water to the pump itself and to the reclaimer tubes.

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If you have a P-K closed-type reclaimer installation or are considering a waste heat recovery operation, use the coupon today. Complete field engineering service is available without obligation.

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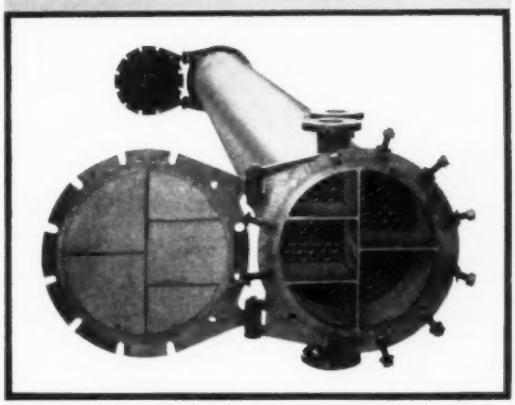

P-K closed type Waste Heat Reclaimer is of multiple pass, single unit construction. Quick opening doors at both ends of reclaimer make inspection simple—downtime negligible.

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R-239 Draper Repair Parts Catalog —Contains illustrations covering all mechanisms and construction with complete listings. Draper Corporation, Hopedale, Mass.

R-240 Baling Presses — Describes complete line of motor-driven and hydraulic baling presses. Logemann Brothers Co., 3150 West Burleigh St., Milwaukee, Wis.

R-241 Textile Machinery Parts Catalog — Describes complete line of Dayco and Thorobred textile parts. Dayton Rubber Co., Dayton, Ohio.

R-242 Instruments For Accuracy. — Systems for sizing and slashing. Bulletin 98229, Taylor Instrument Co., Rochester, N. Y.

R-243 Counting Devices — Describes complete line of counters for every application. Trumeter Company, 1265 Broadway, New York 1, New York.

R-244 Squirrel-Cage Loom Motor — Describes totally enclosed, non-ventilated, constant-speed motors. Westinghouse Electric Co., P. O. Box 2278, Pittsburgh 30, Pa.

R-245 Static Bars — Humorously illustrates how static can be overcome. The Simco Co., 920 Walnut St., Lansdale, Pa.

R-246 Care Of Draper Shuttles — Describes how longer, troublefree service may be obtained. Draper Corporation, Hopedale, Mass.

R-247 Clutch Brake Motor For Draper Looms — Describes compact power package for driving Draper looms. Westinghouse Electric Corp., P. O. Box 2278, Pittsburgh 30, Pa.

R-250 Bulk Handling of Starch—Bulletin surveys advantages and disadvantages of a bulk system for starch. It describes the types of equipment available for each component and gives estimates of costs. A. E. Staley Mfg. Co., Box 151, Decatur, Ill.

R-251 Small Pilot Slasher — Information on new all-electric Callaway Slasher. Ideal for mills which must prepare a lot of samples. West Point Foundry & Machine Co., West Point, Georgia.

R-252 Weaving Machines — Textile job report No. 20 on Warner & Swasey Sulzer weaving machines at Yale Woolen Mills. Warner & Swasey, 5701 Carnegie Ave., Cleveland 3, Ohio.

R-253 One-Piece Sizing Agent — Houghto-Size CW provides low kettle cost, results in free-running warp of high breaking strength, increasing weaving efficiency. E. F. Houghton & Co., 303 West Lehigh Ave., Philadelphia 33, Pa.

R-254 Lubricant for Synthetics — Booklet illustrates Fibregard, a colloidal lubricant that adheres uniformly and continuously to the surfaces of man-made fibers. Harry Miller Corp., 4th and Bristol Sts., Philadelphia 40, Pa.

KNITTING

R-301 Singlehead Full-Fashioned Machine — Literature on request from the Wildman Jacquard Mfg. Co., Full Fashioned Div., Norristown, Pa.

R-302 Forged Head Aluminum Beams — Gives specifications on new high yardage beams. Milton Machine Works, Inc., Milton, Pa.

R-303 Raschel Knitter — Describes new Raschel-type knitting machine. Kidde Manufacturing Co., Inc., 35 Farrand St., Bloomfield, N. J.

R-304 Vibralon For Hosiery—Greater snag resistance, dullness, warmth and absorbency. W. F. Fancourt Co., 519 S. Delaware Ave., Philadelphia 47, Pa.

R-306 Booklets On Fidelity Machines — Details on "400", Multi-Design Ribber, Skein Reelers. Fidelity Machine Co., 3908-18 Frankford Ave., Philadelphia 24, Pa.

R-307 Needle Oil Does Not Stain — Details on "Gulftex 39" developed for knitting mills. Gulf Oil Corp., P. O. Box 1106, Pittsburgh 30, Pa.

DYEING—BLEACHING—FINISHING—PRINTING

R-401 Solvent Detergents — Capabilities and advantages noted. Oakite Products, Inc., 126C Rector St., New York, N. Y.

R-402 Tubes For Package Dyeing — Describes Dytex tubes for one-time use. Sonoco Products Co., Hartsville, S. C.

R-403 Finishing Machinery — Text and photographs of complete line of machinery. Marshall and Williams Corp., 46 Baker St., Providence, R. I.

R-404 Water Analysis — Includes tables, conversion factors, indicators, standard solutions. Solvay Process Div., Allied Chemical & Dye Corp., 61 Broadway, New York 6, N. Y.

R-406 Urea, Formaldehyde.—Literature on urea, formaldehyde or U.F. concentrate-85. Dept. CUFI-29-1, Nitrogen Div., Allied Chemical and Dye Corp., 40 Rector St., New York 6, New York.

R-407 Acid Mordant Blue B—Details on Acid Alizarine Blue B for bright navy shades. Zinsser & Co., Inc., Hastings on Hudson 6, New York.

R-408 Hydrogen Peroxide — Covers properties, uses and handling. Solvay Process Div., Allied Chemical & Dye Corp., 61 Broadway, New York 6, N. Y.

R-412 Cationic Surface Active Agent — Describes Uversoft "D." Harshaw Chemical Co., 1945 East 97th St., Cleveland 6, Ohio.

R-413 Chemicals, Dyes And Intermediates — Complete file of bulletins available. Metro-Atlantic, Inc., Centredale, R. I.

R-414 Wetting Agent — Describes highly concentrated detergent and wetting agent. Rohm & Haas Co., Washington Square, Philadelphia, Pa.

R-415 Peroxide Bleaching System — Illustrates and describes this continuous system. E. I. du Pont de Nemours & Co., Electrochemical Dept. T.I-2, Wilmington, Del.

R-416 Surface Tension Depressant — Tells how product can be used for wetting, dye leveling or as a penetrant. Hart Products Corp., 1440 Broadway, New York, N. Y.

R-417 Textile Chemicals — Describes leading products for wet processers. Royce Chemical Co., Carlton Hill, N. J.

R-418 Industrial Water Treatment — Discusses fundamentals of industrial water treatment. Rohm & Haas Co., Resinous Products Div., Washington Square, Philadelphia 5, Pa.

R-419 Theoretical and Applied Silk Soaking — Outlines methods and gives suggestions. Hart Products Corp., 1440 Broadway, New York 18, New York.

R-420 Brine For Textile Industry — Describes Lixate Process for making brine. International Salt Co., Inc., Scranton, Pa.

R-421 Depuma — Describes odorless, viscous, non-evaporating emulsion for anti-foam. Koppers Co., Inc., Chemicals & Dyestuffs Div., 2010 Clarke Bldg., Pittsburgh 19, Pa.

R-422 Catalyst AC-6 — Tells how curing efficiency may be stepped up as much as 25%. Monsanto Chemical Co., Plastic Division, Dept. T1-3, Springfield 2, Ohio.

R-423 Soda Ash Bulletin — Contains useful data covering this subject. Solvay Sales Division Allied Chemical & Dye Corp., 40 Rector St., New York 6, New York.

R-424 Water Repellent Finish — Describes Aquarol water repellent finish. Arkansas Co., Inc., Newark, N. J.

R-426 Industrial Oil — Catalogs on Industrial Oil and Fatty Acid products. Swift & Company, Industrial Oil Dept., 1800 165th St., Hammond, Indiana.

R-428 Chemical Catalog — Lists products with chemical composition, properties and applications. Antara Chemicals Div., General Aniline & Film Corp., 435 Hudson St., New York 14, New York.

R-429 Chemical Bulletins — Issued each month as a help to wet processers. WICA Chemicals, Inc., P. O. Box 506, Charlotte, N. C.

R-430 Hydraulic Power Units — Describes unit for operating hydraulic textile machines. B. F. Perkins & Son, Inc., Holyoke, Mass.

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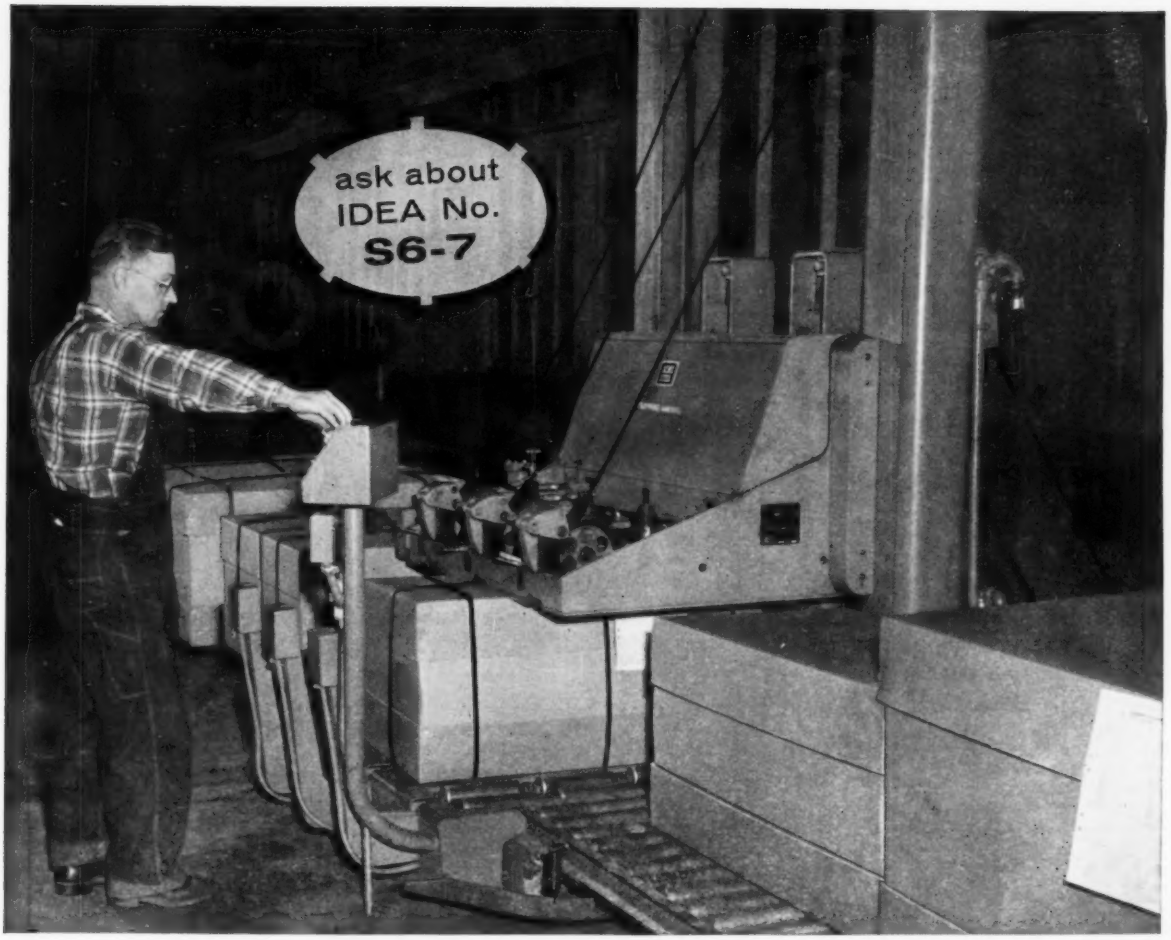

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R-433 Safe Handling Of Hydrogen Peroxide — Lists safety rules to be followed in handling the product. Solvay Process Division, Allied Chemical & Dye Corp., 61 Broadway, New York 6, N. Y.

R-434 Base Detergent Acids—Bulletin tells how new TENN-ACIDS offer simple and practical method for mills to prepare concentrated, low cloud point detergents based on alkyl aryl sulfonates. Tennessee Corp., Marketing Research & Development Dept., 1330 W. Peachtree St., Atlanta 9, Ga.

R-435 Cut Water Treatment Costs — Describes the control of scale, slime, algae and corrosion. Oakite Products, Inc., 126C Rector St., New York 6, New York.

R-436 Rapidase For De-Sizing — The properties and characteristics of Rapidase in detail. Wallerstein Co., Inc., 180 Madison Avenue, New York 16, N. Y.

R-437 Caustic Soda—Book describes the uses, manufacturing processes, unloading and dissolving diagrams, materials of construction, analytical processes, etc. Wyandotte Chemicals Corporation, Michigan Alkali Division, Wyandotte, Michigan.

R-438 Surface-Active Agent — Properties, applications, of Nonionic Actylphenoxyethanol Triton. Rohm & Haas Co., Special Products Dept., Washington Square, Philadelphia, Pa.

R-440 Guiders And Tension Devices — Straight line guiding of open width goods. Mount Hope Machinery Co., 15 Fifth St., Taunton, Mass.

R-441 Processing Arnel Fabrics and Blends — Formulas for dyeing, printing, finishing and heat treating. Celanese Corp. of America, Textile Div., Marketing Dept., Box 1414, Charlotte, N. C.

R-442 Hycar Latices — Physical properties and typical fields of application. B. F. Goodrich Chemical Co.,

R-443 Sodium Hydrosulfite — Literature and test samples are available on "T-C Hydro." Tennessee Corp., 617-629 Grant Bldg., Atlanta, Ga.

R-445 New Finishing Rolls — Money-saving facts about long-wearing, quality rolls. The Dayton Rubber Co., Holfast Div., 1486 Lakewood Ave., Atlanta, Ga.

R-446 Ethanolamines — Lists application, chemical and physical properties. Nitrogen Division, Allied Chemical and Dye Corp., 40 Rector St., New York 6, New York.

R-447 Nappers For Treating Any Fabrics — Complete details on Muller Tri-Napping Machine. Franz Muller, Monchen-Gladbach, Germany.

R-448 Ball Bearing Turn Table — Describes 48-inch steel turn table for mills. Birch Brothers, Inc., 32 Kent St., Somerville, Mass.

R-449 Rotary Dyeing Machine—For use in dyeing hosiery, hats, gloves, socks, etc. Turbo Machine Co., Lansdale, Pa.

R-452 Micro Switch For Wet Process — Advantages and applications in dyeing, bleaching, finishing. Micro Switch Div., Minneapolis-Honeywell Regulator Co., Freeport, Ill.

R-453 Complete Line Of Mathieson Chemicals — Covers organic, inorganic, specialty chemicals. Olin Mathieson Chemical Co., Industrial Chemicals Div., Baltimore 3, Md.

R-455 Aligning Lays—Setting instructions for step-by-step aligning. Draper Corporation, Hopedale, Mass.

R-456 Dyeing and Finishing Machinery — Complete line presented in series of catalogs. Birch Brothers, Inc., 32 Kent St., Somerville 43, Mass.

R-457 Dyeing, Bleaching and Drying Equipment — Complete line for cotton, wool and synthetics described. Color pictures. Morton Machine Works, 1718 3rd Ave., Columbus, Ga.

R-458 Napthol Ratios Slide Chart — Quickly and accurately enables operators to determine Napthol Ratios. Alliance Color & Chemical Co., 33 Ave. P, Newark 5, New Jersey.

R-459 "PCB" Rock Salt — Tells how product saves money, eliminates bad dyeing. Morton Salt Co., Industrial Division, 120 So. LaSalle St., Chicago 3, Ill.

R-461 Wool Oils—Describes influence of wool oils in producing suality yarns and fabrics. Proctor & Gamble Dist. Co., Gwynne Bldg., Cincinnati, Ohio

R-462 Bleaching With Peroxygen Chemicals — Bleaching methods comprehensively treated. Becco Chemical Div., Food Machinery & Chemical Corp., Station B, Buffalo 7, New York.

R-464 Automatic Control System For Continuous Bleaching — How to control temperature, pressure and liquid level. Taylor Instrument Companies, Rochester 1, New York.

R-466 Penford Finishing Gums — Complete data, including physical properties. Penick & Ford Ltd., Inc., 420 Lexington Ave., New York 17, New York.

R-467 Regeneration Of Zeolite Water Softeners — Explains advantages of Lixate Process. International Salt Co., Scranton, Pennsylvania.

R-468 Dyeing Synthetic Fibers—Detailed analysis of methods and materials. General Dyestuff Co., 435 Hudson St., New York 14, New York.

R-469 Single Apron Stock Dryers — Presents latest idea in automatic drying. C. G. Sargent's Sons Corp., Graniteville, Mass.

R-470 Eliminate Dye-Bath Shock — How to protect fabrics from crow's-feet, uneven shades. Foxboro Company, 487 Neponset Ave., Foxboro, Mass.

R-474 Industrial Brushes — Features use on shears, printing machines. M. W. Jenkins' Sons, Inc., 444 Pompton Ave., Cedar Grove, N. J.

R-475 Waste Heat Recovery — Describes system of waste heat recovery from polluted water. Ludell Mfg. Company, 5200 West State Street, Milwaukee, Wis.

R-476 Washers For Scouring, Bleaching, Acidifying — Describes high-capacity, continuous process washers. C. G. Sargent's Sons Corp., Graniteville, Mass.

R-478 Wool Cleaning Unit—Describes unit for cleaning carpet wools mechanically before scouring. Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia 20, Pa.

R-479 Naphthol for Lightfast Browns—Booklet describes new, straight, nonsubstantive naphthol, Naphthol AS-BN, for the continuous naphtholation of cotton and rayon piece goods in the dyeing of economical, fast-to-light browns. General Dyestuff Co., 435 Hudson St., New York 14, New York.

R-480 Softener, Lubricant, Napping Aid—Technical information available on softener, lubricant and napping aid for natural and synthetic fibers, yarns and fabrics. Nopco Chemical Co., Harrison, N. J.

R-481 Handbook on Methocel—Gives technical information and use data on family of methylcellulose ethers called Methocel. Organic Chemicals Sales, The Dow Chemical Co., Midland, Mich.

FIBERS AND YARNS

R-502 Fortisan-36, New Textile Fiber—Includes charts, diagrams, text, presents technical properties. Textile Sales Dept., Celanese Corp. of America, P. O. Box 1414, Charlotte, N. C.

R-503 Caprolan Nylon Heavy Yarns—Describes strength, long flex life and ready dyeability. Fiber Sales Dept., National Aniline Div., 261 Madison Ave., New York 16, N. Y.

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R-507 The Chemstrand Nylon Story—Describes the birth and growth of Chemstrand nylon. Chemstrand Corp., 350 Fifth Ave., New York 1, N. Y.

R-508 Color-Fast Fibers — Further information on "Coloray," Courtauld's solution dyed rayon staple which is a contribution to colorfastness in fabrics. Courtaulds (Alabama) Inc., 600 Fifth Ave., New York 20, N. Y.

RESEARCH—TESTING—LABORATORY

R-601 Testing Instruments—Descriptions of 37 instruments for testing textiles. Custom Scientific Instruments, Inc., 541 Devon St., Kearney, N. J.

R-602 Metal Detector — Spot troublemakers before they harm equipment or fabrics. Radio Corp. of America., Dept. S-271, Building 15-1, Camden, N. J.

R-603 Shadograph Weighing Devices —Pictures and information on various types of scales. Exact Weight Scales Co., Columbus 8, Ohio.

R-604 Evenness Tester—Details on taking the guess out of quality control. Uster Corp., 2516 Wilkinson Blvd., Charlotte, N. C.

R-606 Strobotac — Measures speed of rotating, reciprocating or other cyclic motions. General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass.

R-607 Yarn Count Scale—Data sheet tells how direct-reading instrument provides fast, accurate method of determining yarn count number. Exact Weight Scale Co., Columbus, Ohio.

MANAGEMENT, PROCESS ENGINEERING CONSULTANTS, FACTORS

R-701 Factoring Service—Details on advantages of factoring, including information on general banking and pension plans. Trust Company of Georgia, Atlanta, Ga.

R-702 Beechcrafts At Work — Tells how Beechcraft executive airplanes can save time and money. Southern Airways Co., Atlanta Airport, Atlanta, Ga.

R-705 The Wonalancet Way — Deals with current problems in Textiles. Wonalancet Company, 128 Burke St., Nashua, N. H.

R-706 A Fair Day's Pay And In Return A Fair Day's Work — Outlines proper utilization of labor, material and equipment. American Associated Consultants, Inc., 250 Park Ave., New York, N. Y.

R-707 Non-Woven Fabrics— Booklet gives outline of nature and history of non-wovens and the manufacturing techniques of today. Booklet 56-219A, Chemical Div., Goodyear Tire & Rubber Co., Akron 16, Ohio.

GENERAL PLANT OPERATION

R-801 Textile Brushes — Describes complete line of brushes for all departments of mill. S. A. Felton & Son Co., Manchester, N. H.

R-802 Belt Lacing Equipment — Includes prices, specifications, etc. Clipper Belt Lacer Co., Grand Rapids, Michigan.

R-804 "Motor Selector." — How to select a-c motors for specific application. Bulletin B-2103. Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio.

R-805 Everything For Floor Care — Describes scrubbing, waxing, polishing and mopping equipment as well as waxes, sealers, and cleansers. Finnell System, Inc., Dept. TI, 1300 East St., Elkhart, Ind.

R-806 Rotary Pressure Joints—Details on self-lubricating, self-adjusting, self-aligning joints. The Johnson Corp., Three Rivers, Mich.

R-807 Servicing "One-Shot" Lubricators—Describes high capacity spring discharge piston pump lubricator. Bijur Lubricating Corp., 151 W. Passaic St., Rochelle Park, N. J.

R-809 Wrap Up Lint Problems—Automatic lint filters remove lint from air, winds it into desposable roll. Bulletin 234, American Air Filter Co., 275 Central Ave., Louisville 8, Ky.

R-810 Stop Corrosion — Details on "Speed-Rex" paint for metal, wood and concrete. Truscon Laboratories, Box 69, Milwaukee Junction, P. O. Dept. T, Detroit 11, Mich.

R-812 Mechanical Power Transmission — Includes drawings, dimension, weights, prices, application. Dodge Mfg. Corp., Mishawaka, Indiana.

R-813 Metal Cleaner and Preserver —Describes Immunol, a neutral, nontoxic, non-flammable, odorless solvent that cleans, degreases and rustproofs metal. Harry Miller Corp., 4th and Bristol Sts., Philadelphia 40, Pa.

R-816 Leather Belting — Selection, installation, proper maintenance. Atlanta Belting Co., 508-510 Whitehall St., S. W., Atlanta, Ga.

R-817 One-Shot Lubricators—Details on pull-type semi-automatic lubricators. Bijur Lubricating Corp., 151 W. Passaic St., Rochelle Park, N. J.

R-818 Story of Nylon Bristle. — Tells of discovery and production, with special attention to "Tynex," a form of Nylon ideal for use in brushes. M. W. Jenkins' Sons, Inc., 444 Pompton Ave., Cedar Grove, N. J.

R-820 Floaxial Dial Scales — Explains mechanism and gives applications. Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

R-821 Modern Methods Of Textile Floor Maintenance — Complete details on taking care of mill floors. G. H. Tennant Co., 2530 N. Second St., Minneapolis 11, Minn.

R-822 Industrial Greases — Describes multi-purpose lithium soap industrial greases. Sinclair Refining Co., 600 Fifth Ave., New York, New York.

R-823 Roller Bearings For Textiles —How roller bearings are employed for more profitable textile production. Hyatt Bearings Div., General Motors Corp., Harrison, N. J.

R-824 Cylinders And Boosters — Complete listing of "in stock" equipment including proce and description. Miller Fluid Power Co., 2040 N. Hawthorne, Melrose Park, Ill.

R-828 Blower And Exhausters — Full description, including detailed drawings. Buffalo Forge Co., 490 Broadway, Buffalo 5, N. Y.

R-829 Paint Stripping Booklet — Explains simplified method of stripping paint. Oakite Products, Inc., 22 Thames St., New York 6, New York.

R-830 Air Filtration — Illustrates Auto-Airmat, a dry-type air filter. American Air Filter Co., Inc., 275 Central Ave., Louisville 8, Ky.

R-832 Drinking Fountains & Coolers —Description of all models, dimensions, illustrations. Halsey W. Taylor Co., Warren, Ohio.

R-833 Textile Leathers Catalog — Characteristics and advantages of "Tannate" leathers. J. E. Rhoads & Sons, 2100 W. Eleventh St., Wilmington, Del.

R-834 Catalog Of Needle Bearings — Design, application for five types of needle bearings. The Torrington Co., Torrington, Conn.

R-835 Textile Lubrication — Shows methods and means of lubricating all machinery. The Texas Co., 135 East 42nd St., New York 17, N. Y.

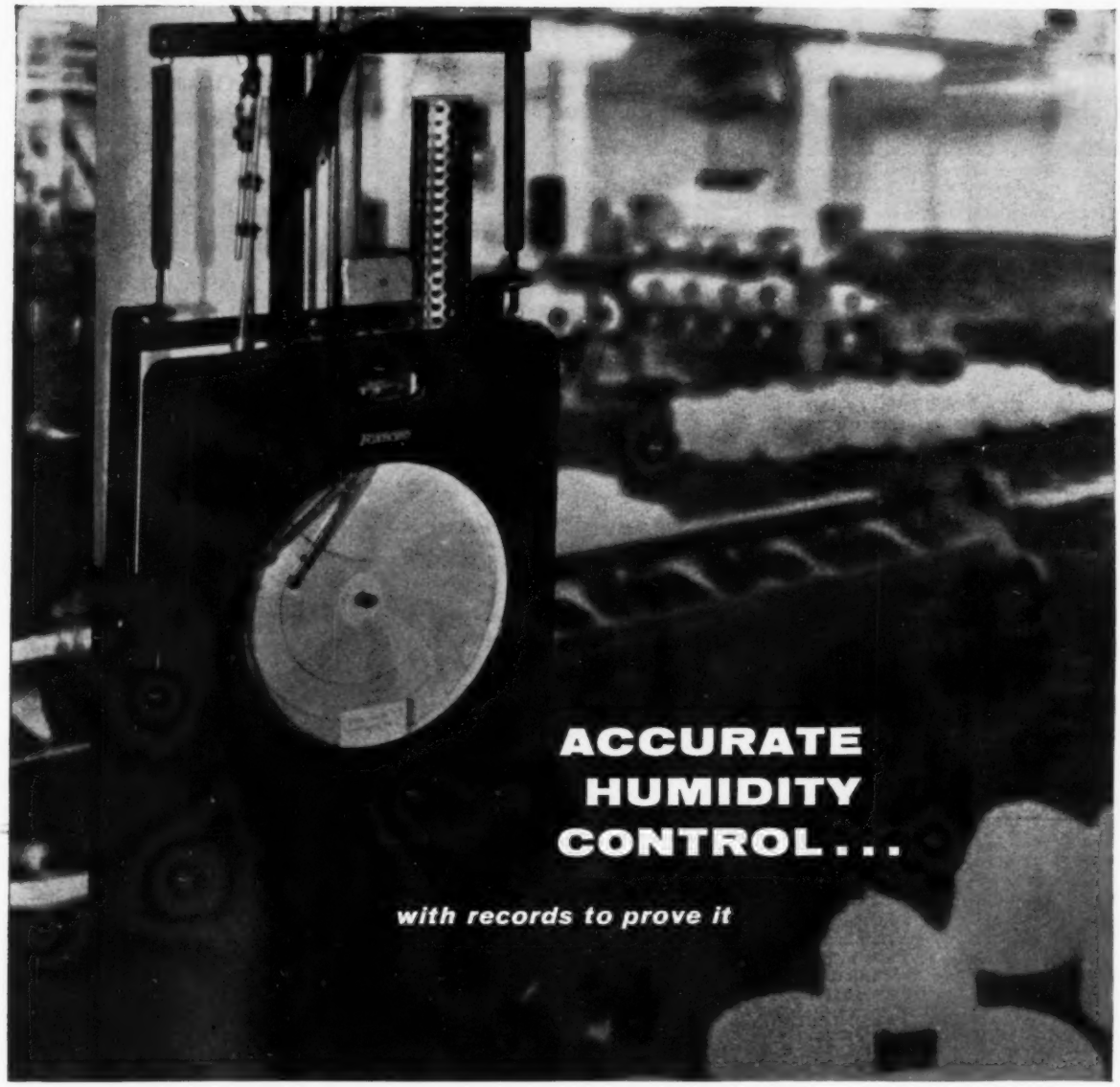
R-836 Metered Lubrication — Points up advantages of central lubrication systems. Bijur Lubricating Corp., Rochelle Park, N. J.

R-837 Service Procedure For Ball Bearings—Helpful manual shows how to increase life of ball bearings. New Departure Div., General Motors Corp., Bristol, Conn.

R-839 Lubrication Of Electric Motors —How to lubricate and clean ball and roller bearings. New York & New Jersey Lubricant Co., 292 Madison Ave., New York 17, New York.

R-840 Ball Bearings For Textile Machinery — Bearings for all phases of textile processing. The Fafnir Bearing Co., New Britain, Conn.

R-841 Lubrication Of Bearings — Helpful list of do's and don'ts to prolong bearing life. New York & New Jersey Lubricant Co., 292 Madison Ave., New York 17, New York.



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R-843 For Static Elimination — Eliminates static safely, simply and inexpensively. Simco Co., 980 Walnut St. Lansdale, Pa.

R-845 Cut Costs With Moyno Pumps — Describes "progressing cavity" pumps for mercerizing and sizing. Bulletin 30-TI, Robbins & Myers, Inc., Springfield, Ohio.

R-847 Lubricants For Textiles — Working samples of bearing lubricants, spindle oils, etc. Georgia-Carolina Oil Co., Box 101, Macon, Ga.

R-849 Detect, Extinguish Fires. — Describes portable and built-in extinguishers; smoke detecting and rate-of-rise fire detecting systems. Catalogue "P-40", Dept. "A", Walter Kidde & Co., Inc., Main St., Belleville 9, N. J.

R-850 New Lubricated Plug Valves—Semi-steel and steel lubricated plug line. The William Powell Co., 2525 Spring Grove Ave., Cincinnati 22, Ohio.

R-851 "Tank Talk"—Shows various types of elevated steel tanks. R. D. Cole Manufacturing Co., Newnan, Ga.

R-852 Cotton Mill Equipment — Traces pictorially the steps in processing raw cotton into finished cloth. Westinghouse Electric Corp., 511 Wood St., Pittsburgh 30, Pa.

R-853 Micro Switch Bulletin—Catalog of products includes prices, applications, etc. Micro Switch Div., Minneapolis-Honeywell Regulator Co. Freeport, Ill.

R-854 Roller Bearings For Textiles—How roller bearings can help production. Hyatt Bearings Div., General Motors Corp., Harrison, N. J.

R-855 Unit Heater — Data on the Herman Nelson horizontal and vertical units. American Air Filter Co., Inc., 215 Central Ave., Louisville, Ky.

R-856 Stainless Steel For Textiles—Applications and advantages of stainless textile equipment. Allegheny-Ludlum Steel Corp., Dept. TI-93, Oliver Bldg., Pittsburgh 22, Pa.

R-857 Finnell Combination Scrubber-Vac—Illustrated literature gives complete specifications and describes various methods of combination-machine-scrubbing, including method recommended for cleaning oily floors.—Finnell System, Inc., 1300 East St., Elkhart, Indiana.

R-861 "Vari-Pitch" Sheave Bulletin —Control by means of pitch diameter adjustment described. Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

R-862 Prevent Corrosion of Plain Steel — Describes special C-17 Pre-Krete, a hydraulic cement formula, designed to prevent corrosion or rust of plain steel vessels. Pocono Fabricators, Inc., Div. of Patterson-Kelley Co., Inc., East Stroudsburg, Pr.

R-863 Penetrating Wood Finish — Describes floor seals for textiles. E. I. Du Pont De Nemours & Co., Inc., Finishes Div., Wilmington, Del.

R-864 Certified Climate Air-Changer System — Describes use with direct humidification for partial or complete air conditioning. Parks-Cramer Co., Fitchburg, Mass.

R-868 Ridge Tool Prices—Capacities and weights included along with pictures. Ridge Tool Co., Elyria, Ohio.

R-869 Stainless Steel Fabrication — Information on ventilating and drying, slasher exhaust, and materials handling in stainless. Sims Metal Works, West Point, Ga.

R-872 Metal Conveyor Belts — Illustrates entire range of manufacture. Ashworth Bros., Inc., Metal Products Div., Fall River, Mass.

R-873 Rihco Humidifiers And Cooling Systems—Describes new atomizers to lessen air consumption in evaporative cooling systems. Aldrich Machine Works, P. O. Box 750, Atlanta, Ga.

R-874 Dynac Brake Motors—Electrical braking of a-c motors-roving, spinning, knitting. Westinghouse Electric Corp., Pittsburgh, Pa.

R-875 Textile Applications For "Scotch" Tape—Some good ideas on using "Scotch." Minnesota Mining & Mfg. Co., St. Paul 6, Minn.

R-877 Industrial Floor Finishes—16-page book contains specifications and descriptions of industrial floor finishes for textile use. Includes directions for application. Minnesota Paints, Inc., 1101 Third Street, South, Minneapolis, Minn.

R-878 HUMIDIFICATION BY GRADUVAC. Bulletin gives details on gravity type atomizer control system and tells how supply of water to atomizers is automatically regulated. Parks-Cramer Co., Fitchburg, Mass.

R-879 SWITCH IDEAS. "How Others Do It" is publication containing ideas submitted by plant engineers and electricians showing how they've used snap-action switches to increase production efficiency. Micro Switch, Div. of Minneapolis-Honeywell Regulator, Freeport, Ill.

MATERIALS HANDLING

R-901 Casters And Wheels—Casters and wheels for all applications. Darnell Corp., Ltd., 12000 Woodruff Ave., Downey, Calif.

R-902 Canvas Baskets — Complete line for textile use. W. T. Lane & Brothers, Poughkeepsie, N. Y.

R-903 Overhead Handling Equipment — Shows successful applications of monorail systems. American Monorail Co., 13106 Athens Ave., Cleveland 7, Ohio.

R-905 Conveyor Key Book—How to step-up production with modern conveying. Logan Co., 1115 Franklin St., Louisville, Ky.

R-906 How To Select A Lift Truck—Excellent means for price comparison between similar trucks. Hyster Co., 2902 N.E. Clackamas St., Portland 8, Oregon.

R-907 Corrugated Containers — Describes Multi-Unit and Bulk Container. Gaylord Container Corp., 111 N. 4th St., St. Louis 2, Mo.

R-909 Tramrail Engineering And Application — Data on how Tramrail Equipment can cut handling costs. Cleveland Tramrail Div., Cleveland Crane and Engineering Co., 1036 East 289th St., Wickliffe, Ohio.

R-910 How To Specify Packaging — Regulations on shipment, how to determine which package to use. Hinde & Dauch, Sandusky, Ohio.

R-911 New Lift Trucks—Shows latest trends in lift truck design. Hyster Co., 2902 N.E. Clackamas St., Portland 8, Oregon.

R-912 Materials Handling For Textiles—Shows how fibre trucks can increase efficiency, protect products. National Vulcanized Fibre Co., Wilmington 99, Del.

R-913 Continuous Power Conveyor—Complete information on Zig-Zag Conveyor. Richards-Wilcox Mfg. Co., Aurora, Ill.

R-914 Stresses On Overhead Tracks —Covers track peening, discusses stresses. Cleveland Tramrail Div., Cleveland Crane & Engineering Co., Wickliffe, Ohio.

R-915 Scientific Materials Handling —Describes various materials handling devices, includes pictures. Bennett Rose Co., Box 8, Roebuck, S. C.

R-916 Overhead Materials Handling —Treats twin fan ceiling cleaners and shock proof electrification as well. Louden Machinery Co., Fairfield, Iowa.

R-917 Little Packaging Library — Series of booklets covers the business of shipping in corrugated boxes. Hinde & Dauch, Sandusky, Ohio.

R-919 Improved Materials Handling —"Materials in Motion" describes use of fibre containers. National Vulcanized Fibre Co., 1056 Beech St., Wilmington, Del.

R-920 Trucks Doff, Store, Become Spooler Tray—Brochure tells how mobile boxes are being used as doff boxes, storage boxes, and spooler trays on Barber-Colman Spooler. Fisher Mfg. Co., Hartwell, Ga.

Shorts and Remnants

(Continued from page 26)

Sheets for Prison

" . . . At this time we are looking for information as to a supplier of sheeting with a woven-in name such as those woven into blankets and bed spreads. These sheets would have approximately 74 x 66 thread counts, 4.6 ounces per square yard. The name of an Institution to be woven into each sheet length."

ROSS V. RANDOLPH
Warden,
Ill. State Pen.
Menard, Ill.

► " . . . constant subscribers . . " Th. & A. Brandt, Nurnberg, Germany, wrote for further data on "The Libby loom, a new American machine." The Libby loom, developed by **Carl F. Libby,** V. P. of J. W. Wood Elastic Web Co, Stoughton, Mass., is a shuttleless loom for elastic webbing used only in Woods' five plants. So far as TI editors know, it is not commercially available.

Neps By Standard Photos

"I read with great interest . . . 'Neps Measured by Standard Photos' [Apr. '58]. This system has apparently been developed for cotton. I am interested in learning if any such standard photographs have been developed for synthetic fibers, and if so, where they might be obtained. . ."

E. D. LANCASTER
J. P. Stevens & Co., Inc.
Greer, S. C.

" . . . We are interested in knowing if the Standard Photos . . . . are available and also the Test Platter, and if so, would it be possible to obtain this for use in our own operations. . ."

J. F. DUNN
Pur. Agt.
Canadian Cottons Ltd.
Hamilton, Ont., Can.

► To Mr. Lancaster: To the best of our knowledge there are no standard photos for card webs of synthetic fibers; to Mr. Dunn, the author of this article advises that the standard photos and test platter are commercially available from Sven Ericsson & Co., Packhusgatan 4 B, Goteborg C, Sverige.

► " . . . Very excellent article . . . " writes **Harold Murray** on "The Why and How of Textile Printing" (Feb. '58). More praise on this article came from American Finishing Co., Memphis, Tenn.

► One thing about this if you are frowning when you finish this here

column, it just proves you should stand on your head or read it upside down. (Courtesy "The Avondale Sun" who labeled this "Recession Blues" and "Operation Upturn.")

► So long until fall—Sept.—that is.

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Readers are invited to make use of this section for further discussion of published articles, or for discussion of problems arising in the plant. Names will not be used without permission. Payment is made for practical articles or for letters containing manufacturing information.
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Personal NOTES ABOUT MEN YOU KNOW

E. D. Lacey, president of Russell-Lacey Manufacturing Co., Fairmount, Ga., was elected president of the

Staff photo

Tufted Textile Manufacturers Association at the 13th national convention in Daytona Beach, Fla. Newly elected vice-presidents are: **J. C. Brooker,** Brooker Spread Co., Dalton, Ga.; **Russell C. Gebert,** James Lees & Sons Co., Bridgeport, Pa.; **Sam H. Hodges, Jr.,** Alabama Bedspread Co., Scottsboro, Ala.; and **A. L. Zachry, Jr.,** G. H. Rauschenberg Co., Dalton, Ga. * * * **Robert T. Miller** has joined the staff of the Association as publicity director.

Charles F. Goldthwait, retired head of cotton chemical processing research at the Southern Utilization Research and Development Division, Agricultural Research Service, has received a $1,000 cash award for his development of a new type of conforming cotton bandage. The development is said to have saved the Government $5 million in military procurement during 1952 alone, as compared with a cost of development of $75,000.

Newly elected officers of the South Carolina Textile Manufacturers Association are: president, **P. S. Bailey** of Clinton-Lydia Cotton Mills; vice-president, **Fred B. Dent** of Mayfair Mills, Arcadia.

Halbert M. Jones, president of the American Cotton Manufacturers Institute and the North Carolina Textile Manufacturers Association, was awarded an honorary doctor of humanities degree during the recent commencement exercises of North Carolina State College in Raleigh.

Hugh M. Comer, chairman of the board of Avondale Mills, was chosen to receive the University of Alabama's Algernon Sydney Sullivan award for 1958. The award is presented annually to one non-student in recognition of "fine spiritual qualities practically applied to daily living."

Charles C. Hertwig has retired from his position as chairman of the board of Bibb Manufacturing Co. in Macon, Ga. He will continue as a director. **Robert Train,** president, will assume the duties of chairman in addition to those of his own office.

Grover C. Furr, Sr., was honored recently at a testimonial dinner given by his associates in Burlington Hosiery Co., Greensboro, N. C. Mr. Furr, a Burlington Hosiery executive for the past 19 years, left active association with the Burlington Industries member company on July 1. He continues in a consulting capacity. * * * **John Harden,** a vice-president of Burlington Industries and director of public relations, has resigned his position with the company effective July 31, and will go into business for himself as a public relations counsellor. He will continue to serve Burlington Industries in his new capacity. **William L. Beerman, Jr.,** will become active head of the company's public relations department.

Chairman of the new Man-Made Fiber and Silk Committee of the American Cotton Manufacturers Institute is **Robert M. Schwarzenbach,** president of Schwarzenbach Huber Co. Vice-chairman is **James P. Marion,** vice-president of Bloomsburg (Pa.) Mills, Inc.

John B. Payne has accepted a position as sales administrator with West Georgia Mills, Inc., Whitesburg, Ga. Mr. Payne was previously sales supervisor and branch manager of the southeastern states for Clopay Corp.

J. P. Stevens & Co., Inc., has appointed **J. A. White,** a vice-president, to the post of assistant general manager of manufacturing for the synthetics division. **Gaston Jennings** has been promoted to manager of the Monaghan plant and the tufting unit

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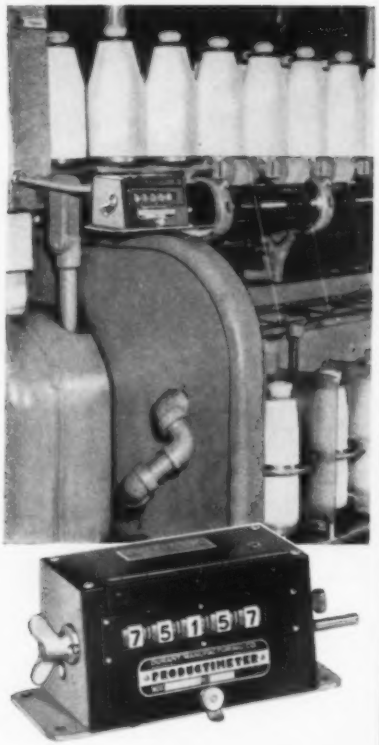

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Personal NOTES ABOUT MEN YOU KNOW

in Greenville, S. C., and the Victor and Greer plants at Greer, S. C. * * * **Marvin B. Crow** has been named superintendent of the Victor plant in Greer. * * * **Odis E. Little,** formerly superintendent of the Monaghan plant, is now office manager of the Monaghan and Victor plants. **Gerald S. Tompkins, Jr.,** succeeds Mr. Little as Monaghan plant superintendent.

John P. Quinn, executive vice-president of Sayles Finishing Plants, Inc., and Sayles Biltmore Bleacheries, has been transferred to Biltmore, N. C., where he will assume management on the retirement of **Frank O. McShane** late in 1958. **George A. Baker** has taken over Mr. Quinn's management duties in the Saylesville, R. I., plant.

Reid S. Murphey, president of Signal Knitting Mills, Chattanooga, Tenn., has been appointed to the National Defense Executive Reserve. He is the first appointee from the underwear industry.

Staff photo

Newly elected officers of the Southern Textile Association are: (1. to r. seated) **Horace Pennington,** Cone Mills Corp., chairman of the board; **Walter D. Vincent,** Dan River Mills, president; **Joe Jenkins,** Pelzer Mills, first vice-president; **Bob McCrary,** Carolinian Mills, second vice-president. Standing are new board members **Lewis Thompson,** Riverdale Mills; **Herman Cone, Jr.,** Cone Mills Corp.; **Joe Chalmers,** Greenwood Mills. Also elected but not shown was **Charles Ward,** Highland Cotton Mills.

The Great Barrington (Mass.) Mfg. Co. has appointed **A. Durfee Damon,** formerly general manager of Dutchess Bleachery, Wappingers Falls, New York, as industrial fabric finishing manager.

J. A. Baker has been named president of Hadley-Peoples Manufacturing Co., Siler City, N. C. Mr. Baker, who heads J. A. Baker & Co., a Charlotte, N. C., firm of cotton merchants, succeeds **Mason P. Thomas** who retired.

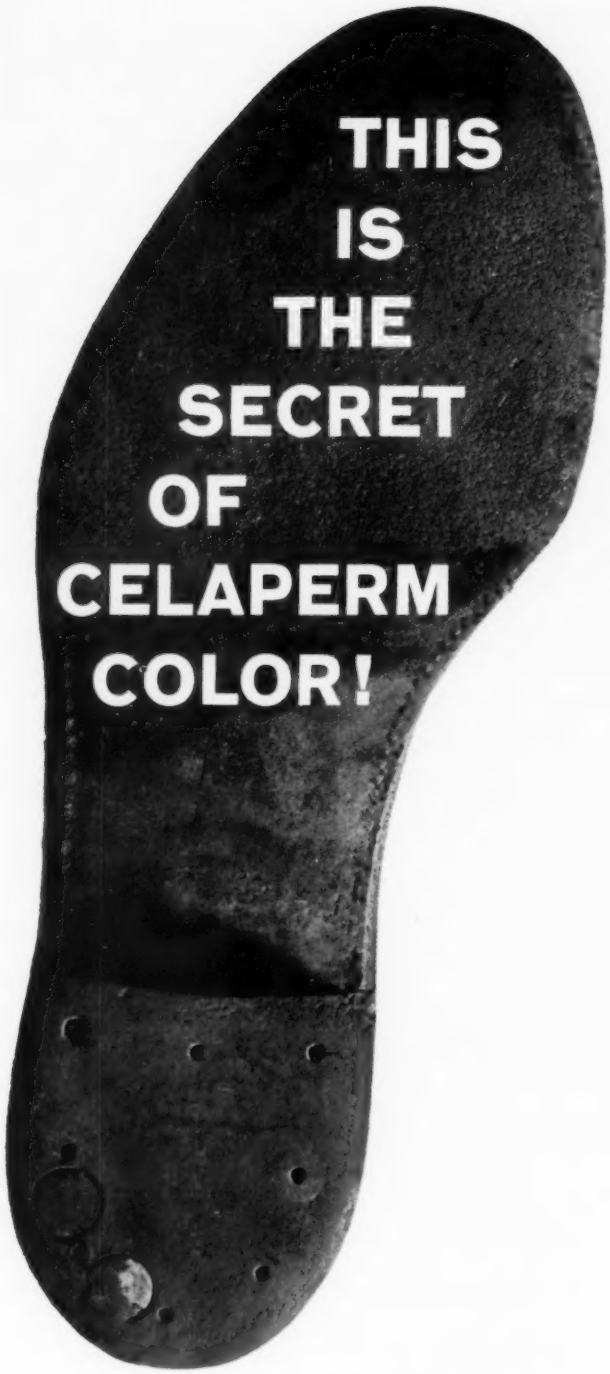
Ralph Westcott has been appointed managing director of Jantzen, Ltd., Brentford, England. He has been manager of Jantzen's Portland, Ore., factory. **Harry Dalton** becomes production manager of the firm's Portland, Ore., and Vancouver, Wash., plants, the newly-created position having been occasioned by Mr. Westcott's appointment. **Bud Shea** has assumed management of the Portland factory and **Kenneth Brenne** takes over as Vancouver factory manager.

Furman University has presented the Algernon Sydney Sullivan award for 1958 to **Bennette Eugene Geer.** Dr. Geer, who is 86 years of age, is a retired textile executive and educator.

Celanese Corp. of America has named **Frank B. Cameron** manager of the spun yarn plant in Burlington, N. C.

G. Martin Brill Watts is the new board chairman of Fantasy Yarns, Inc., Philadelphia, Pa., following the novelty yarn firm's reorganization. **Abe Luisky** is president, and **J. J. Klumpp** is vice-president.

W. Terrell Webster, Jr., has been appointed to the newly-created position of general sales manager, Glove Div., Riegel Textile Corp. Advanced to the post of assistant general manager was **J. L. Chambliss.** Both Mr. Webster and Mr. Chambliss make their headquarters at the Conover, N. C., general sales offices. * * * Riegel Textile Corp. has named **Wil-**



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Personal NOTES ABOUT MEN YOU KNOW

liam Thurlow manager of market research and product development, a new post. His duties will be under the supervision of G. C. Gardner, executive vice-president, and William Reid, president.

Roanoke (Va.) Mills, Inc., has promoted **James R. Stevenson** to the post of assistant production manager.

John P. Hine (left), who graduated from Georgia Institute of Technology in June, 1958, with the degree of Bachelor of Science in Textiles, is shown receiving the Cotton Manufacturers Association of Georgia medal from secretary **Frank Carter.** Mr. Hine, presently associated with Burlington Industries, Inc., Brighton Div., Shannon, Ga., finished with highest honors in the textile school and also was declared the outstanding student of Delta Kappa Phi fraternity.

William K. Love, Jr., of Anderson, Clayton & Fleming has been elected president of the New York Cotton Exchange. Elected vice-president was **Tinney C. Figgatt.**

Thomas S. Tolar, formerly president of Pacific Mills, has joined Klopman Mills, Greensboro, N. C., in a manufacturing capacity. * * * **John L. Morgan** has been named vice-president in charge of the Raeford (N. C.) division of Pacific Mills. Succeeding him as plant manager is **M. Erwin Sibley,** promoted from superintendent. **E. H. Hines, Jr.,** has been appointed vice-president in charge of worsted manufacturing with headquarters at Halifax, Va.

The Philadelphia Textile Institute has awarded **J. Spencer Love,** board chairman and president of Burlington Industries, Inc., Greensboro, N. C., an honorary degree as Doctor of Textiles. At the same time the honorary degree of Doctor of Textile Science was conferred on **M. Earl Heard,** vice-president in charge of research, West Point Manufacturing Co.

The North Carolina State College School of Textiles' chapter of Phi Psi Fraternity has honored **Charles H. Reynolds** as "Man of the Year." Mr. Reynolds is vice-president and resident manager of Spindale (N. C.) Mills and Cherokee Textile Mills, Sevierville, Tenn.

P. S. Bailey, president of Clinton and Lydia Cotton Mills, Clinton, S. C., was recently honored by his alma mater, Presbyterian College. **Dr. Marshall Brown** (left), P. C. president, presented a special alumni citation to Mr. Bailey at the dinner,

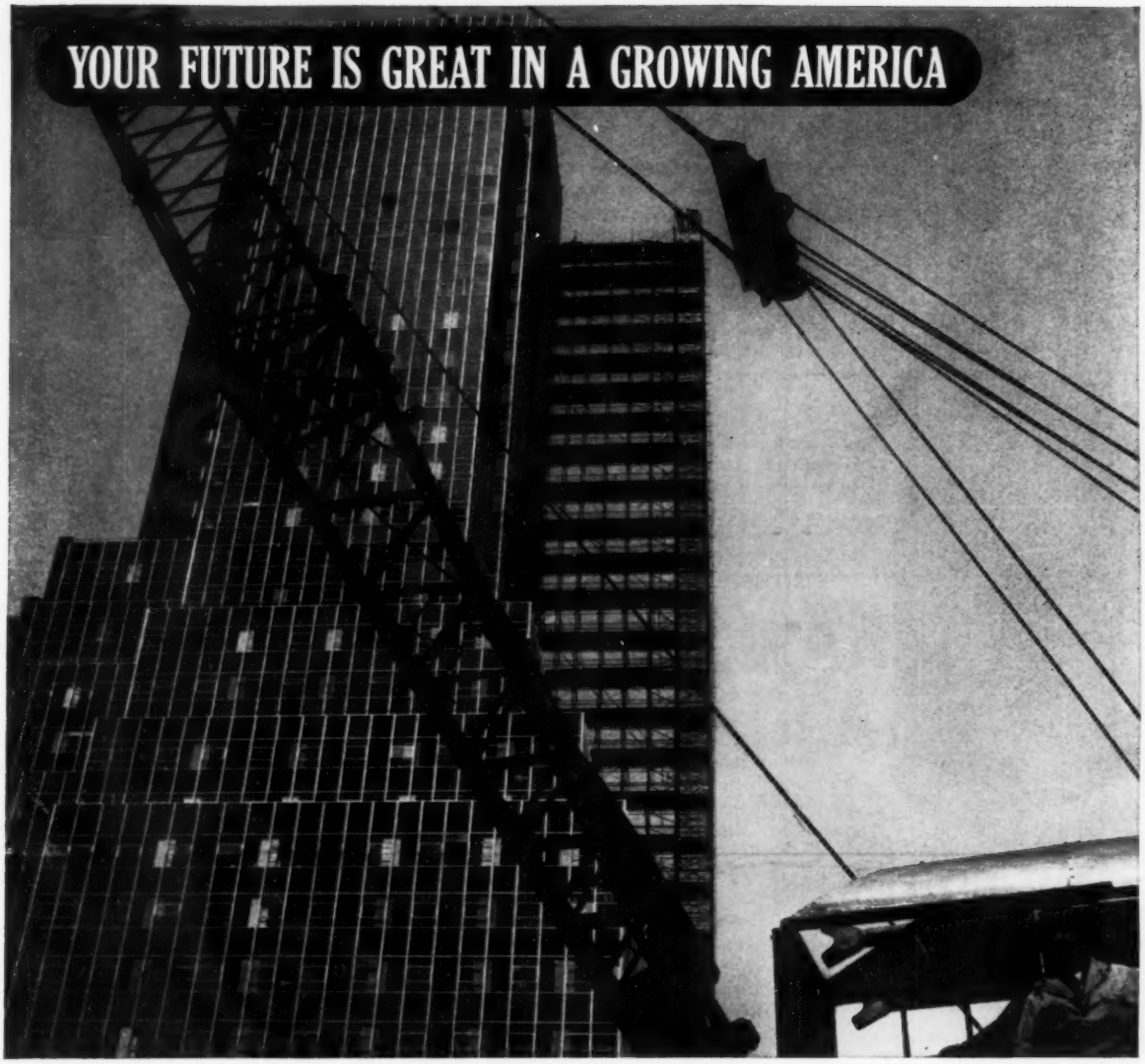
William M. Shields photo

in the school dining hall, which was attended by more than 150 textile mill executives and Clinton civic club members. Dr. Brown made the award "in recognition of outstanding achievements and services in the field of textiles which reflect honor upon this college."

Gold-Tex Fabrics Corp., Rock Hill, S. C., has named **George B. Peeler** general manager. **George W. Britt** has been appointed to the newly-created post of superintendent.

Henry A. Reinhardt has been named a vice-president of James Lee and Sons Co., Bridgeport, Pa. His duties will cover product development and engineering responsibilities. He was formerly with Bigelow-Sanford Carpet Co. as vice-president of engineering and manufacturing.

Henry O. Walton, Barnes Worsted, Inc., Kingston, Mass., has added the duties of superintendent to those of designer, a post he has filled for many years. In the former post, he succeeds **Fred E. Morton,** who was honored at an open house at Barnes



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Personal NOTES ABOUT MEN YOU KNOW

following his recent retirement. **Louis Nogueria,** who will continue as Mr. Walton's assistant, will also assume the duties of overseer of weaving.

Bates Manufacturing Co., Lewiston, Me., has named **Ervin L. Miller** to the post of assistant to the president and vice-treasurer of the firm.

William B. Harlan has been named director of public relations of C. H. Masland & Sons, Carlisle, Pa. He succeeds **Donald Rich, Jr.,** who has accepted a position with Communication Services, Inc., Mechanicsburg, Pa. * * * **Ira B. Wheeler, Jr.,** has been appointed manager of marketing research for Masland. His headquarters are in the firm's New York City sales offices.

George H. Day, II, has been appointed to the newly-created post of general manager of screen products of Chicopee Mills. He will supervise manufacturing, sales, and advertising of Fiberglas and Lumite screening, produced at the Lumite Div., Chicopee Mfg. Corp., Cornelia, Ga.

The cotton buyers division, Cotton Manufacturers Association of Georgia, has elected **D. P. Cook, Jr.,** West Point (Ga.) Manufacturing Co., to the office of general chairman. **Robert E. Taliaferro,** Crown Cotton Mills, Dalton, Ga., was elected vice-chairman.

Faribault (Minn.) Woolen Mill Co. has named **R. E. Johnson** a vice-president. **Elmer Schulz,** also a director, replaces Mr. Johnson in the office of secretary.

The Carlisle (S. C.) Finishing Co. has announced the appointment of **William Bryan Davis** as head of the local purchasing department. Purchasing will be under the over-all supervision of **Fletcher Jordan, Jr.,** who is responsible for purchasing activities of both Union Bleachery and Carlisle Finishing Co.

George M. Heard, personnel manager of the Clarke Mills in Jackson, Ala., was officially named "Man of the Year" for Jackson in 1957 at the recent annual Civitan banquet.

The new president of the National Association of Wool Manufacturers is **William I. Kent,** president of Kent Manufacturing Co., Clifton Heights, Pa. Mr. Kent, who is 41, is the youngest president in NAWM history. He succeeds **John P. Stevens, Jr.,** J. P. Stevens & Co.

Mr. Wheeler
C. H. Masland

Mr. Simpson
U. S. D. A.

The United States Department of Agriculture has conferred the Superior Service Award on **Jack Simpson** of the Southern Utilization Research and Development division of the Agricultural Research Service in New Orleans, La. Improvements in the processing of cotton fiber into yarns of better and more uniform quality, and reduction of the method to workable formulas and charts for the use of the textile industry were the basis for the award.

Dr. Bertrand W. Hayward, president of the Philadelphia Textile Institute, received the honorary degree, Doctor of Laws, at commencement exercises of Colby College in Waterville, Maine.

Harold G. Dean has been named vice-president of Glen Raven Silk Mills, Inc., with headquarters at the company's New York sales offices.

Erwin L. Miller has been appointed assistant to the president of Bates Manufacturing Co., Lewiston, Me.

Herbert J. Smith, Jr., has joined Orr Felt and Blanket Co., Piqua, Ohio, and is in charge of blanket manufacturing.

Continental Mills, Lewiston, Me., has elected **David J. Meehan** to the presidency. He succeeds his father, **George V. Meehan,** who will continue as a director of the firm.

Willis T. Windle has been elected vice-president in charge of finance of Mohasco Industries, Amsterdam, N. Y.

Fairlawn-Richmond Finishing Co., Fairlawn, N. J., has elected **Harry Moore** a director.

Mr. McPhee
Bigelow-Sanford

R. P. Smith
W. R. C. Smith

Richard P. Smith, president of W. R. C. Smith Publishing Co., Atlanta, Ga., publishers of TEXTILE INDUSTRIES and five other trade journals, was elected chairman of the board of National Business Publications, Inc., at its annual spring meeting.

Bigelow-Sanford Carpet Co., Inc., New York City, has appointed **George E. McPhee** director of manufacturing, with responsibility for all carpet and yarn making operations. Before joining Bigelow-Sanford, Mr. MacPhee was associated for many years with the carpet industry in Great Britain.

OBITUARIES

John S. Alexander, 83, retired owner of Powdrell & Alexander, Largo, Fla.

William H. Brinkley, southern division sales manager for E. F. Houghton & Co., Greensboro, N. C.

Louis M. Cotchett, 62, consulting engineer to textile industry, Whitman, Mass.

Milton E. Davis, 61, vice-president and Philadelphia plant manager of Franklin Process Co., Wrentham, Mass.

David Elwell, 75, vice-president and director of Lockwood Greene Engineers, Inc., New York, N. Y.

Harry B. Goldsmith, 80, retired fabrics manufacturing executive, New York, N. Y.

Robert L. Helton, retired master mechanic of Callaway Mills Co., Milstead, Ga.

Joseph B. Johnson, 43, secretary and general manager of Carolina Underwear Co., Thomasville, N. C.

James L. Kay, 100, retired superintendent of Robinson Woolen Mill, Oxford, Me.

Charles S. Lydecker, sales manager of the Loyal T. Ives Co., Inc., New Brunswick, N. J.

Stanley Morton, 78, retired treasurer of Lanett Bleachery & Dye Works, Weston, Mass.

Arlan P. Mosser, 55, treasurer of Windsor Knitting Mills, Inc., Wyomissing, Pa.

John M. Mullen, 63, editor and publisher of the *Southern Textile News,* Lincolnton, N. C.

Dr. R. Franklin Poole, 64, president of Clemson College, Clemson, S. C.

John W. Randall, 83, retired yarn executive, Philadelphia, Pa.

Elvin B. Robinson, 57, vice-president and general sales manager of Ideal Machine Shops, Inc., and Ideal Industries, Inc., Gastonia, N. C.

Morris Rosenkrantz, 73, founder of Argo Knitting Mills, Pottsville, Pa.

Abbott Stevens, 69, retired textile executive, Lawrence, Mass.

Dr. William H. Stratford, 79, chairman of the board, Stratford Hosiery Corp., Haw River, N. C.

Charles G. Tate, Sr., 76, former textile mill executive, Morganton, N. C.

Thomas Witherspoon, 50, partner in Viewmont Hosiery Mills, Hickory, N. C.

Benjamin Wood, 60, executive director of American Rayon Institute, Greenwich, Conn.

Joseph H. Zens, 79, retired textile mill executive, Milwaukee, Wis.

NON-FLUID OIL
TRADE MARK REGISTERED

THE ALL-AROUND LUBRICANT

Wherever lubrication is needed in the textile mill operation, chances are NON-FLUID OIL will do the job most efficiently and economically.

Being drip-less and waste-less, NON-FLUID OIL prevents bearing wear that results in uneven card sliver. In spinning, it stays in roll stands—lubricating until entirely consumed—and protects roll covers.

NON-FLUID OIL stays in and on bearings, increasing production by keeping machines in steady service and preventing oil-spot "seconds." It lubricates constantly and dependably, staying on rings and off rails—giving less "black" yarn and fewer broken ends.

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Columbus, Ga.	Springfield, Mass.	Providence, R. I.
Charlotte, N. C.		St. Louis, Mo.

NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture. So-called grease imitations of NON-FLUID OIL often prove dangerous and costly to use.

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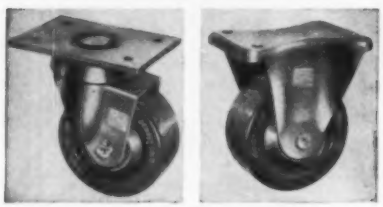

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What the TEXTILE MILLS are doing

The "812 Loftwist" line of **Cabin Crafts-Needletuft Rug Mills** has been awarded the National Institute of Rug Cleaning's "Seal of Cleanability." The award followed a series of rigid test. The "812 Loftwist" line is made

Charles Powers, vice-president of Cabin Crafts, receives the seal from Herbert K. Beshar, vice-president of NIRC.

of 100 per cent solution-dyed rayon tufted approximately 48 loops per square inch. The back cloth is 10-ounce jute plus 5.6 Kraftcord scrim. Back sizing is of natural rubber.

Cyril Johnson Woolen Co., Stafford Springs, Conn., has announced plans to enter the women's wear market with woolens in all-wool and blends for coats, suits, and sportswear.

Mallory Mills Corp., New Bedford, Mass., has been purchased by the Acadia Co., New York textile converters. A new firm, called **Arco Mills, Inc.,** has been formed to run the New Bedford plant. Acadia Co. executives hope to double present production.

John Mura and James Tomasso have purchased a two-story building in Chepachet, R. I., where they plan to operate a textile mill. The building formerly housed a branch of Pendergrast Mills.

Patent has been granted for a new kind of stretch pantie to John Gift, with **Alba Hosiery Mills, Inc.,** Valdese, N. C., designated assignor. The pantie is formed from a flat-fashioned knitted blank, rather than cut and sewn, and incorporates a heavier stretch yarn in the crotch area than in the body of the garment. There are no fashioning marks in the leg and crotch area.

Pilgrim Curtain Co. has purchased the Warren, R. I., curtain mill of **Berkshire Hathaway, Inc.**

As an expansion move, **Eastland Woolen Mills,** Corinna, Me., has purchased additional cards and spinning frames.

Peter Fuller Enterprises, Inc., has purchased the real estate, machinery, and equipment of the **Verney Mill,** Manchester, N. H., from Gera Corp.

Augusta Knitting Corp. has begun relocation of its entire operation in Lumberton, N. C., with the move from the Utica, N. Y., plant scheduled to be completed by the end of 1958. * * * Production of knitted sportswear and pajamas has already begun in the **Jones Knitting Corp.** (formerly Augusta Knitting Corp.) plant in Lumberton. When removal of machinery from the Utica plant is completed, the firm expects to increase the number of employees from 65 to 200.

Roxbury Dyeing Corp. has been opened in Paterson, N. J. The new firm occupies the former Dutchess Dyeing Corp. plant.

Herzl Finishing Co., Putnam, Conn., has instituted an expansion program which is expected to result in the hiring of additional personnel in eleven departments.

A group of minority stockholders has acquired control of **Delaware Mills, Inc.,** with plants in New Castle and Frederica, Del. William C. Appleton is the new president and Walter E. Ingrahm is treasurer.

A program of consolidation and "streamlining" of operations in certain of its plants has been announced by **Textiles-Inc.,** Gastonia, N. C. According to Don Maddox, vice-president in charge of production, all single knitting yarns are to be produced in one unit in the Mutual and Arlington mill buildings. The Mutual building will house the pickers, cards, drawing frames, and lap winders. Product of these operations will then be transported to the Arlington plant for the balance of the processing. All twisters will be moved from Arling-

ton building to Winget building to make room for an additional 15,000 spinning spindles from the Mutual and Winget mills. Myers Mill will be put on thread yarn which will be twisted at Winget. It was emphasized that the company will continue to operate all of the equipment now in use, and that the move will not involve any major purchase of new equipment. "The move is not only one of combining the single yarn units," Mr. Maddox explained, "but it is one to improve quality and service and make the over-all operation more versatile."

A "floatable" rope has been developed and is being marketed by **Shuford Mills, Inc.**, Hickory, N. C. The braided linear polyethylene line is a product of the plastics division and was developed particularly for use in water sports. Sizes range from three thirty-seconds of an inch in diameter, up to a half-inch. The line is said to be competitive in price and strength with cotton or hemp lines, but will not kink or rot, thus having a longer life.

Carrboro (N. C.) Mills, operated by Pacific Mills, will be closed shortly. Closing is reported to be due to "generally poor business conditions in the highly competitive woolen industry, aggravated by greatly increased imports of foreign goods."

The fabrics of **Rochambeau Worsted Mills**, Pawtucket, R. I., were used as a background for the exhibit of Coptic art in the Old Slater Mill Museum.

The Reading (Pa.) Dyeing Co. is liquidating its holdings. One of the main reasons for liquidating was given as "dwindling activity in the textile field."

Callaway Mills Co. has installed a latex compounding unit as the latest addition to expanding tufted carpet operations at Hillside Plant, to meet the requirements for latex backing compound for carpets. Natural latex, shipped from India and the East Indies, is transferred to tank cars for rail shipment to LaGrange.

The Chemstrand Spinnerette, house organ for the **Chemstrand Corp.**, Decatur, Ala., has been selected as the top industrial newspaper-magazine publication for the state of Alabama. The publications judging was sponsored by the Birmingham Council of Industrial Editors.

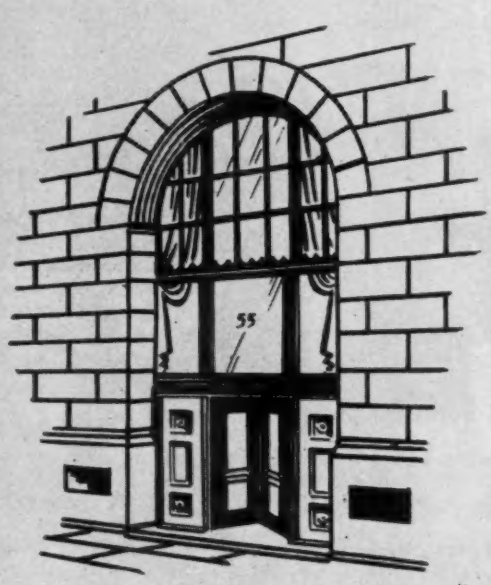
A new firm, **Berglas Woolen Mills, Inc.**, has been formed in Dudley, Mass., to produce woolens, worsteds, and blends for the women's wear trades.

Extensive changes have been made in the weaving and spinning departments of the Oakland Plant of **The Kendall Co.** in Newberry, S. C. Diaper looms from the company's Pelzer, S. C., mill have been transferred to Oakland, and 66 plain looms have been moved into the basement near the cloth room. Print cloth and other types of fabrics are being made there now, in addition to the regular constructions. Spinning department changes include installation of vacuum end collection equipment and new type overhead cleaners.

A commission finishing division has been established in Danville, Va., by **Dan River Mills, Inc.** Stanley Foster, formerly with Fairforest Finishing Division of Reeves Bros., Inc., will direct the selling of the services

Our service is tailored to provide all the working capital any qualified client needs, without increased borrowing, diluting profits or interfering with management.

Information available for any manufacturer or distributor with $500,000 or more annual sales.



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Providing operational financing for the apparel, electronics, furniture, leather, plastics and textile industries.

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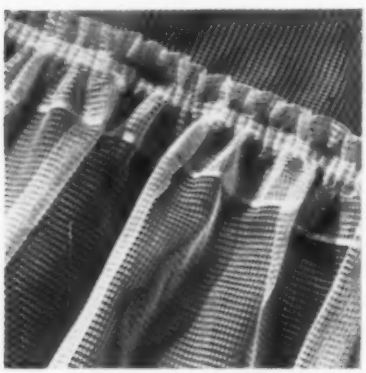
What the TEXTILE MILLS are doing

of the new organization, to be known as the Schoolfield Finishing Plant. He will report to executive vice-president, Basil D. Browder. Although Dan River has carried on job finishing for several years, there has been no established organization for promoting this phase of the company's business. * * * Dan River's recreational park for employees and their families is now open. Facilities include a large lake (well stocked with bass and bream), a clubhouse with showers for bathers, a beach, aluminum boats, and a variety of amusements for children. * * * Eleven Boy Scouts in the Danville, Va., area were recently awarded the Textile Merit Badge, an accomplishment which is reported to have been the result of a program developed by Dan River upon learning of the dwindling interest in this phase of scouting.

The first double dimity weave in 100 per cent "Dacron" polyester fiber for the curtain market is being offered by **L. R. Moulton Co.,** Melrose,



Mass., according to Du Pont. The new fabric is washable, quick-drying, and needs little or no ironing.

The **Elizabeth Hosiery Mill** is now operating in North Wilkesboro, N. C. Operations begun with 40 machines, with an additional 40 to be added in the near future. The new firm manufactures bobby socks for teen-agers and athletic socks for basketball and golf. Plans call for operation of the plant on three shifts before the end of the year.

Franklin Process Co., a division of Indian Head Mills, was recently cited for excellence in advertising at the Annual Creative Awards Dinner of National Advertising Agency Network at the Seignory Club, Montebello, Quebec.

An addition to **Garrison Hosiery Co.,** Burlington, N. C., will be completed in August. The expansion move will double the existing floor area, providing additional space for offices and warehousing.

Twenty employees of the **Clinton (S. C.) Cotton Mills** have completed textile vocational classes in spinning frame calculations and card grinding and fixing. The classes were under the joint sponsorship of the mill and the S. C. Department of Education.

Cone Mills Corp., Greensboro, N. C. has acquired the controlling interest of Otto B. May, Inc., manufacturer of vat dyes, salts, and bases in Newark, N. J. Dr. Ernest M. May will continue as president and no changes in the staff of the May firm are contemplated.

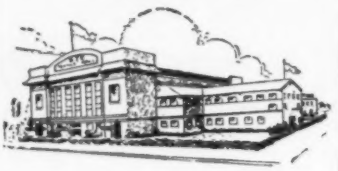
Crest Hosiery Mill has purchased **Cardinal Knitters, Inc.** Both firms are located in Hickory, N. C. The Cardinal knitting plant property has been sold and all equipment and machinery will be moved to the Crest Hosiery Mill as soon as a suitable addition can be built to house the machinery. With the acquisition of Cardinal's equipment, infants' and misses' knitted socks will be added to the men's sock line produced by Crest.

M. Lowenstein & Sons, Inc., has concentrated all accounting and clerical operations in Anderson, S. C. Heretofore the work has been handled in the individual mills of Lowenstein's five-state organization. Internal audit and research units have also moved to Anderson.

James Lees and Sons Co., Bridgeport, Pa., has introduced three permanently moth-proofed all-wool tufted fabrics for summer and fall selling. According to the announcement, the moth-proofing process utilized gives "lifetime" protection against moths, carpet beetles, and other insects, retaining its effectiveness through extreme conditions of acidity, alkalinity, and elevated temperatures.

The Kendall Co. has consolidated the marketing functions of its Cotton Mills (grey goods) and Kendall Mills (finishing and industrial and consumer products) divisions to "capitalize on the sales and merchandising talents of the divisions . . . which have overlapping markets."

Show Week in Greenville
October 6 - 10



See TI's October issue for a complete preview

The printing division of **Riegel Textile Corp.,** Trion, Ga., has received a certificate of appreciation from management upon the department's completion of one year without a lost time accident.

The Carter Plant of **J. P. Stevens & Co., Inc.,** in Wallace, N. C., played host to 33 executives of leading lingerie manufacturing firms recently. President Robert T. Stevens, who accompanied them, told Carter plant employees that they had made the Wallace operation "one of the most outstanding fabric mills in the world."

A teen-age club has been organized at **Union Bleachery,** Greenville, S. C. Youths from the age 14 through 19 are eligible for membership. Rules governing the club are printed on the membership cards and any violation will be punished by dismissal from the group.

A finishing division has been established in a building purchased some time ago by the **Maiden (N. C.) Spinning Mills.** Heretofore, the firm produced knit goods in the grey. Employees of the company will be increased by approximately 30.

Management and operation of **Marinette (Wis.) Knitting Mills** has been assumed by **Strutwear, Inc.** On completion of the present two-year arrangement, a new agreement will be negotiated. The Marinette operation will be conducted on a profit-sharing basis. In assuming the management of the firm, Strutwear will add bulky knit sweaters to the present line of products.

May 29 was designated "Monroe Mills Day" in recognition of the completion of 21 years of operation and the beginning of the annual vacation period for employees of **Monroe Mills,** Monroeville, Ala.

SUPPLIERS News

WHAT THEY ARE DOING

Commercial Factors Corp. has appointed Arthur L. Karmiohl and James A. McMurria to the rank of assistant vice-president. Mr. Karmiohl is director of research and development, as well as director of advertising and public relations. Mr. McMurria is the firm's southern field representative. He makes his headquarters in Columbus, Ga.

Fred C. Hassman, Jr., has been named to the newly-created position of assistant southern division manager of **Corn Products Sales Co.** with headquarters in Memphis, Tenn. Succeeding him as manager of the Memphis branch office is Clifford M. Jennewein.

Neil J. Heaslip has joined the new business staff of **Crompton-Richmond Co., Inc.** In his new position he will continue calling on the hosiery trade from his headquarters in the firm's New York offices.

Thomas J. Ault, former president of several divisions of Borg-Warner

Mr. Ault

Corp., has been elected president of **Saco-Lowell Shops.**

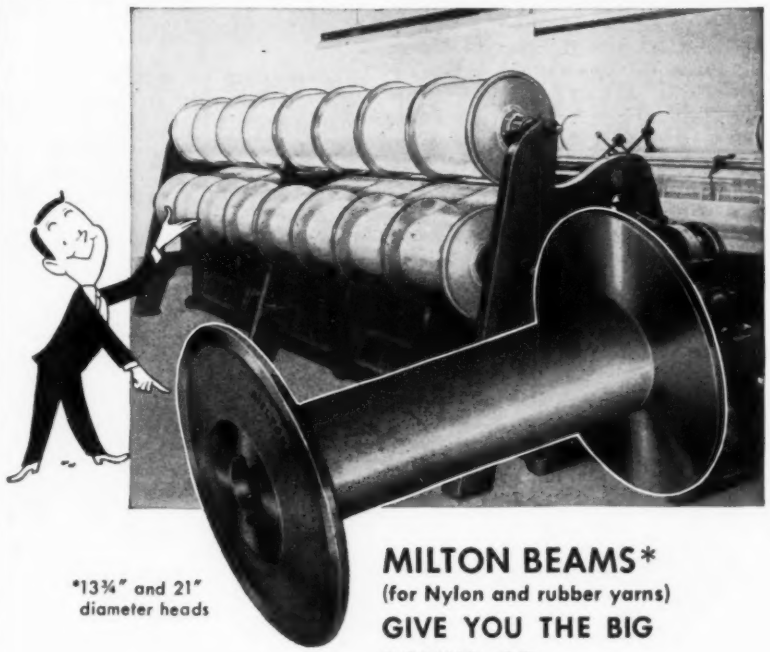
Crown Zellerbach Corp. will construct a new plant at Orange, Tex., in a move designed to increase its production of polyethylene film for packaging.

Crucible Steel Co. of America has elected L. L. Ferrall executive vice-president. Replacing him as vice-president-operations is J. D. Dickerson.

Armstrong Cork Co. has appointed E. W. Jones manager of the industrial division's newly established product planning department. His headquarters will be at the company's general offices in Lancaster, Pa. D. M. Smith succeeds Mr. Jones as manager of the Philadelphia district office.

Merrill E. Pratt has been named chairman of the board of **Continental Gin Co.** He succeeds Robert Lynch who retired earlier this year to give full time to his position as president of Atlantic Steel Co.

Coriamid, Inc., has been formed in Fitchburg, Mass., to act as exclusive U. S. distribution and marketing agents for "Coriamid" adhesion transmission belting. The firm will also handle American sales of "Coriatex" condenser tapes for wool cards.



"13¾" and 21" diameter heads

MILTON BEAMS* (for Nylon and rubber yarns) **GIVE YOU THE BIG BONUS OF**

SUPER STRENGTH

The super strength of Milton's forged head Tricot and Raschel Beams is no idle claim—it's been proven by yarn producers, big mills and small mills alike!

They're light in weight, yet rugged in design to give true dimensional stability without objectionable deflection or distortion. Milton's forged, heat-treated aluminum alloy heads and extra heavy barrels become a one-piece beam by the continuous weld process first introduced in the field by Milton. Trapped ends of yarn or misalignment of keyways are eliminated because there are no mechanical joints!

You name the yarn . . . monofilament, fine denier, low turn or high twist—synthetics or rubber, Milton gives you true-running, well balanced beams to handle unprecedented yardages and extreme pressures!

WRITE FOR FREE BULLETINS . . . No. 49-A on Light Metal Beams and No. 54-S on Steel Beams. The Milton line includes warp beams for broad, narrow fabric, velvet and carpet looms, as well as light metal raschel, tricot and section beams.

Over a Quarter Century of Dependability in Yarn Beams

MILTON MACHINE WORKS, INC.

DESIGNERS • ENGINEERS • MANUFACTURERS

MILTON · PENNA.

SUPPLIERS News
WHAT THEY ARE DOING

The Du Pont Co. has acquired certain patent applications of **American Enka Corp.** relating to textured yarn process. As a result of the acquisition, rights under Enka's former patents and applications will be included, at no additional royalties, under licenses covering manufacture of textured yarn which Du Pont now makes available to the industry. Enka's licensing program will be discontinued.

At the regular monthly meeting of the **Atlanta Chemical Sales Club,** the following officers were elected to serve one year: Harry V. Ackerman, **E. I. du Pont de Nemours & Co., Inc.,** president; Leroy C. Stewart, **Dow Chemical Co.,** vice-president; Robert W. Wurst, **Pennsalt Chemicals Corp.,** secretary; and James E. Murray, **Tennessee Corp.,** treasurer. The club is composed of chemical sales executives living in Atlanta who represent national firms engaged in the manufacture of basic chemicals.

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Walter B. Eklund has been named by **Warren Pumps, Inc.,** to succeed W. L. Ripley as operations manager. Mr. Ripley will retire at the end of the year and at that time Mr. Eklund will assume complete charge in his new position. Charles F. Dexter has been appointed to the post of sales manager of the industrial division, vacated by Mr. Eklund.

Whitin Machine Works has promoted J. Lawrence Orr to the position of southern agent in the sales office in Charlotte, N. C., succeeding R. I. Dalton, Jr., who has been transferred to the company's main office in Whitinsville, Mass.

Draper Corp. has appointed Edward Cranshaw manager in charge of all spinning and bobbin sales and service. Mr. Cranshaw's background includes 14 years' mill experience in the capacity of superintendent. His headquarters will be in the South, but his office will serve all mills both in the North and in the South.

Mr. Cranshaw
Draper Corp.

Mr. Bagley
Curtis & Marble

Harry W. Bagley has been appointed to handle the woolen and worsted machinery sales for **Curtis & Marble Machine Co.** Prior to joining Curtis & Marble, Mr. Bagley was plant manager of Textile By-Products Corp.

Joshua E. Murrow, Jr., has joined the synthetic fibers group, research department of **Union Carbide Chemicals Co.,** division of Union Carbide Corp. He will work on applications of new experimental fibers for the textile industry. * * * Union Carbide Corp. has announced that construction will proceed on the technical service laboratory at its Westchester County, N. Y., property. Construction was decided on to expand facilities necessary to broaden the scope of customer service and application research.

Universal Winding Co. has announced receipt of initial orders for Unifil Loom Winders from Drayton Mills, Judson Mills, Laurens Mills, Schwarzenbach-Huber Co., and Waumbec Mills.

H. J. Daigneault of National Aniline Div., **Allied Chemical Corp.** has been elected president of the Vat Dye Institute, Inc. Other new officers include: J. C. Walker, **Toms River-Cincinnati Chemical Corp.,** senior vice-president; T. C. Keeling, **Koppers Co., Inc.,** vice-president; and J. R. Bonner, **General Dyestuff Co.,** treasurer.

Cutler-Hammer, Inc., has acquired Airborne Instruments Laboratory, Inc. Under the terms of the agreement, Airborne Instruments will operate as the electronics division of Cutler-Hammer.

Dayton Rubber Co. is planning to construct a new mechanical rubber goods plant in Springfield, Mo., to enable the company to manufacture mechanical rubber goods more efficiently and to expand production. * * * A. L. Freedlander, Dayton Rubber's board chairman, recently received a special citation during the dedication of the new Dana Science Bldg. at Indiana Technical College. He was selected on the basis of his outstanding contributions to industrial development through management, science, and engineering.

Karl L. Rohde, Jr., has been assigned as sales representative for organic chemicals for southern California by the **Dewey and Almy Chemical Co.** division of W. R. Grace & Co. From his Los Angeles headquarters, Mr. Rohde will serve customers in the textile, plastics, paper, etc., industries.

Samuel Helfand has accepted a position with the textile development group of **Dow Chemical Co.,** Williamsburg, Va. He will be concerned with wet processing technology for Zefran.

Robert Mercer has been named to fill the newly-created position of technical service representative for the **Adell Chemical Co.**

Air Reduction Co., Inc., has started construction on a new chemical plant and an extensive pilot plant facility at Calvert City, Ky. The plant, which is expected to be completed early in 1960, will produce 20 million pounds per year of polyvinyl alcohol resin. The company also plans to build an extensive pilot plant facility at Bound Brook, N. J., which will be used in support of the production and sale of

polyvinyl alcohol. Additional plans include the construction of a new laboratory and office building at Piscataway Township, N. J.

Godfrey R. Van Kampen has been named manager of burner sales for **Process Heating Co.**

Harry F. Holmes has accepted a position on the sales staff of **Putnam Chemical Corp.** and will cover the Pennsylvania and Maryland territories. * * * Putnam's new manufacturing plant at Beacon, N. Y., is now completed. The firm's headquarters, including technical service, warehousing, and manufacturing will be centered at the new location.

In a move designed to extend its services to customers, **Reliance Electric and Engineering Co.** has created two management positions. E. L. Bronold has become sales manager of apparatus sales and C. Porter Packard has assumed his duties as sales policy manager in the department of marketing services. Both have headquarters at the company's main offices in Cleveland.

Reynolds Metals Co. has moved its sales headquarters from Louisville, Ky., to Richmond, Va. All of the company's headquarters functions are now located in Richmond.

Roberts Co. has completed a spinning frame modernization program at Rudisill Spinning Mills, Inc., Lincolnton, N. C. Improvement in drafting was the principal goal of the changeover. Also included were umbrella type creels and suction cleaning.

Joseph T. Ryerson & Son, Inc., entertained some 800 visitors at dinner recently following a tour of the firm's new quarters in Charlotte, N. C.

The board of directors of **Saco-Lowell Shops** has approved construction at this time to provide approximately 25,000 sq ft more space at the Sanford, N. C., plant and a similar amount at the plant in Easley, S. C., for re-housing additional departments of the textile machinery operations now in Maine. This is part of Saco-Lowell's long range program of relocating its textile machinery division in the South.

Eric B. Norman has been appointed assistant sales manager of **B. F. Perkins & Son, Inc.** He will be in charge of sales to the textile and paper trades, with headquarters in Holyoke, Mass.

William E. Conklyn has been appointed vice-president, sales, of **Fife Manufacturing Co., Inc.** His headquarters are in the Baltimore, Md., sales office which serves the states of Maryland, Virginia, and portions of other adjacent states.

Dr. A. S. Endler has joined **Apex Chemical Co., Inc.** as a member of the firm's research and development staff.

George W. Wernz has been named to fill the newly-created position of manager, merchandising services, **Eastman Chemical Products, Inc.** The post was created to broaden Eastman's services to its customers.

Federal Pacific Electric Co. has completed a new regional manufacturing plant in Atlanta, Ga., for fabrication and assembly of panelboards, switchboards, motor control centers, and special enclosures. The plant will service customers in North and South Carolina, Georgia, Florida, Tennessee, Alabama, Louisiana, Mississippi, and Virginia. W. L. Sullivan is regional sales manager.

Mr. Norman
B. F. Perkins & Son

Dr. Endler
Apex Chem.

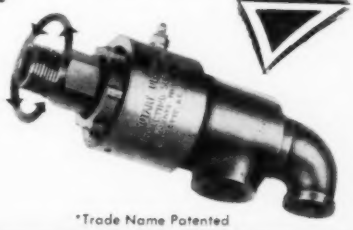
Mr. Land
Vickers, Inc.

Mr. Conklyn
Fife Mfg. Co.

Archie Laird has been appointed manager of the Atlanta, Ga., office of **Vickers, Inc.** He was previously sales application engineer in the Detroit office.

The ROTARY UNION Outlasts all other Rotating Joints

The Rotary Union's patented construction, with its optically flat mechanical seal, automatically adjusts to pressure ranges . . . eliminates mechanical maintenance and adjustments. Gives smooth sealing and unmatched service on all types of rotating heating or cooling equipment. Ball bearings reduce wear and power consumption.



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- **Self-Adjusting**
- **Pipe Sizes ¼" thru 3"**

"WHERE *Good Connections* COUNT"®

*Trade Name Patented

PERFECTING SERVICE COMPANY, 332 Atando Ave., Charlotte, N.C.
Baltimore—Buffalo—Camden, N. J.—Chicago—Cleveland—Los Angeles
New York—Providence—Hamilton, Ont.—Montreal—Toronto

SUPPLIERS News
WHAT THEY ARE DOING

Mr. Hunter
Sandoz, Inc.

Mr. Roth
Becco Chem.

Mr. Kindron

Mr. Kraft
Becco Chemical Div.

Minor Hunter, a technician specializing in textile printing and chemical sales throughout the southern states, has joined the Charlotte, N. C., office of **Sandoz, Inc.** He is doing sales work and providing technical service.

Francis A. Kraft has been promoted to assistant manager of the New York-Philadelphia sales territory of Becco Chemical Division, **Food Machinery and Chemical Corp.** * * * Edward M. Roth, Jr., has been named manager of the upper New York sales territory of Becco Chemical with headquarters at the company's main plant. * * * John R. Hopkins has been appointed assistant sales manager of Becco. He will have charge of the division's advertising and publicity and assist in field sales activities. * * * Robert R. Kindron has assumed his new duties as technical assistant to Becco's New England sales manager. * * * FMC has changed the name of its Organic Chemicals division to the Chemicals & Plastics Division.

Patent has been granted to Richard Briggs and assigned to **Birch Brothers, Inc.**, on Birch's high production automatic "Supreme" grey room butt-seam sewing machine.

Blaw-Knox Co., Chemical Plants Div., has been awarded a contract to build a new textile - finishing - compound plant by **Seydel-Woolley & Co.**, Atlanta, Ga. Versatility of the plant equipment will be such that it can be used to manufacture a great number of other textile chemicals.

Herbert S. Kishbaugh has been appointed assistant manager of the New York sales branch of the Solvay Process Division, **Allied Chemical Corp.**

Clinton F. Kucera has been named manager of the New York district office of **Allis-Chalmers Industries Group.** He succeeds N. W. Landis, recently named manager of Allis-Chalmers' northeastern region.

The Louis Allis Co. has completed a district office and warehouse building in Los Angeles Cal., to provide augmented facilities for immediate product delivery, application engineering, and service in the southern California area.

Amalgamated - Southern, Inc., has changed its name to **Cindet Chemicals, Inc.** Robert A. Bruce is president of the Greensboro, N. C., firm and Robert H. Smith is secretary.

The fibers division of **American Cyanamid Co.** has appointed James E. Ryan as woolen and worsted representative for the woven goods department. * * * Gottfried A. Kappelmeier has joined American Cyanamid's fibers division as a specialist in spinning. He has held posts with German textile firms engaged in cotton, rayon, and synthetic fiber spinning.

American Viscose Corp. has named Leslie L. Walmsley to head the dyeing and finishing division of its technical and textile service department. His headquarters will be Marcus Hook, Pa.

Dr. A. S. Endler has accepted a position with the research and development staff of the **Apex Chemical Co., Inc.**

William Boas heads the new Chicago sales office and show room recently opened by **Appleton Machine Co.** While head of M. G. Boas & Son, Mr. Boas developed the technique of printing on acetate, cellulose, polyethylene, and other clear plastics. * * * Appleton Machine Co. has promoted John M. MacDonald to manager of market development.

Arthur J. Steffans, Jr., has been appointed sales supervisor, Armour Coated Abrasives Div., **Armour & Co.** He will supervise both industrial and retail sales in North and South Carolina and in the eastern section of Tennessee. Mr. Steffans resides in Charlotte, N. C.

The showroom of the Textile Division, **The Fletcher Works**, has been redesigned and expanded to make room for three new machines. They are a label producing loom, a high speed nylon loom, and a high speed elastic web loom.

New entomological research and chemical analysis laboratories for testing Mitin mothproofed fabrics have been completed at the headquarters of **Geigy Chemical Corp.** Mills applying the company's durable mothproofer to woolen raw stock, yarn, or fabric are entitled to free tests of samples of their materials in both of these laboratories.

James M. Crawford, vice-president and general manager of the motor and generator division of the **General Electric Co.**, has retired. Succeeding him as general manager is Oscar L. Dunn.

The Kelco Co., manufacturers of algin products, has appointed Hal M. Swenson central south sales representative. He will make his home in New Orleans, La.

Percy A. Legge has moved the Philadelphia office to 8 Cynwyd Rd., Bala-Cynwyd, Pa. For approximately 70 years, the firm was located at 134 Chestnut St., Philadelphia.

James E. Whitehead has been named exclusive sales and service representative for **Lewis - Shepard Products, Inc.**, in Alabama, northwest Florida, and southeast Mississippi. He makes his headquarters in Birmingham, Ala.

Samuel Bicknell Lincoln, chairman of the board of **Lockwood Greene Engineers, Inc.**, has received the degree of Doctor of Engineering from the University of Maine.

Midwest Piping Co., Inc., has reopened its sales office in Atlanta, Ga., under the direction of John Castleman.

Edwin J. Grajeck has joined the Fluorochemicals div., Chemical Products Group, **Minnesota Mining and Manufacturing Co.**, as technical service representative with headquarters in Bristol, Pa. Among the 3M fluorochemical products he will represent is "Scotchgard" brand stain-repeller.

Mr. Fiedler

Mr. Yeager
Textile Machine Works

Mr. McDermott
Clark, Cutler, McDermott

Mr. Williams
Ciba Co.

Hans Fiedler has been named general sales manager of **Textile Machine Works.** Succeeding him as wire products division manager is Lester Yeager. Both men make their headquarters in Reading, Pa.

The assignment of J. B. Williamson to the Atlanta, Ga., office of **Ciba Co., Inc.,** will further consolidate the staff of Ciba's dye sales and service center for the Georgia, Alabama, and Tennessee areas. With Mr. Williamson making his headquarters in the Atlanta office, collaboration on laboratory assistance from the southern district at Charlotte and with New York headquarters will be expedited. Lewis Darden will assist Mr. Williamson on all laboratory work at Atlanta.

The Horace T. Potts Co. has established a four-year scholarship in industrial distribution at Temple University.

Gordon H. Platt has been appointed a sales engineer by **Taylor Fibre Co.** He is assigned to the firm's New England office at West Hartford, Conn.

Construction will begin shortly on a complete processing plant for **Texize Chemicals, Inc.,** in Palestine, Texas. The plant is expected to be in operation shortly after the first of next year.

Clark, Cutler, McDermott Co. has elected F. Roland McDermott president. Leo G. McWilliams is treasurer and Henry J. Aimone vice-president.

B. Gudjonsson has been named manager of the Greenville, S. C., branch of **Edda International Corp.**

Graton & Knight Co., Inc., has been purchased by **L. H. Shingle Co.** The 107-year-old G. & K. firm will continue to operate in Worcester, Mass., with many of Shingle's other operations being transferred to that location. George L. Abbott will continue as president of the Worcester operation.

Edwin J. Seiferle has been appointed director, market research and appraisal, for the marketing research and development department of the **Tennessee Corp.** Concurrently William C. Duckworth was named market development specialist for organic chemical intermediates. Both men will make their headquaters in Atlanta, Ga.

Wendell D. Ray has been appointed manager of the Boston branch of **A. E. Staley Manufacturing Co.** He succeeds R. E. Kilty. * * * Frank W. Julsen has assumed his duties as corn division advertising manager of A. E. Staley Manufacturing Co.

Relocation and expansion of the Baltimore, Md., sales offices and warehouse facilities of **L. Sonneborn Sons of Maryland, Inc.,** enables the firm to meet increased customer demands in the Maryland and Virginia areas. John D. Sullivan is manager.

Morningstar-Paisley, Inc., has acquired **Thruston & Braidich,** importer and processor of water-soluble gums.

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LAWRENCE, MASS., U. S. A.

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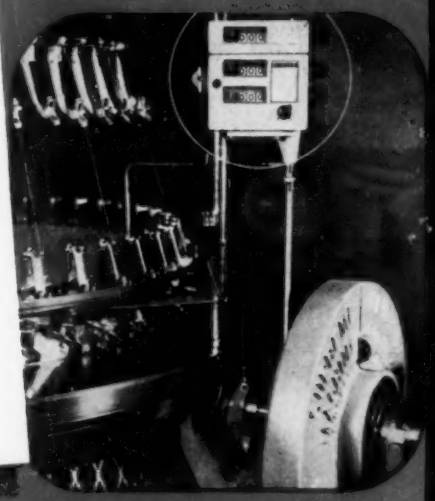
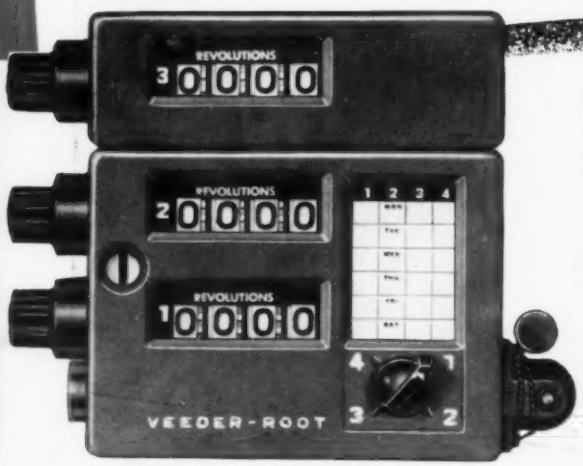


3-shift Revolution Counter on Supreme Knitting Machine.



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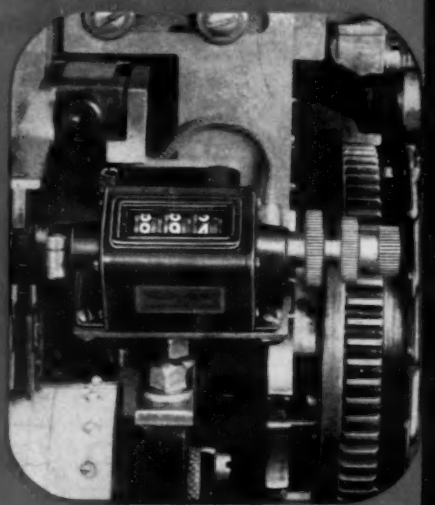
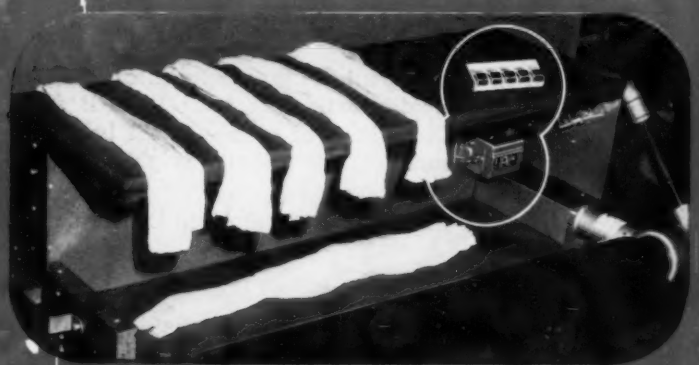
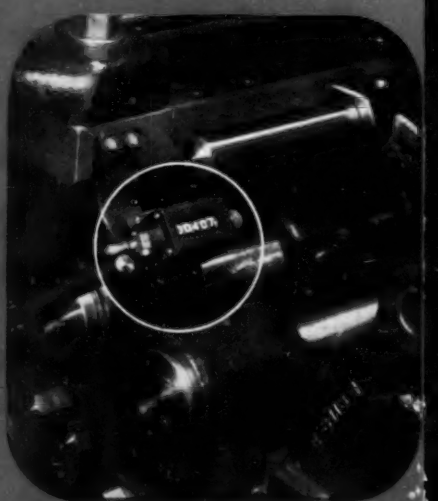


Small Subtractive Predetermining Counter on Philadelphia Jacquard Knitting Machine.



Vary Tally and Large-Figure Hosiery Dozens Counter on Specialty Mfg. Company's "Inspectomatic" Table.



Small Reset Ratchet Counter on Textile Machine Works' full-fashioned hosiery machine.

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